

## Therapeutics.

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### ARTICLE IV.

#### **Adrenalin.**

The extract of the suprarenal gland is one of the comparatively new additions to the armament of the general practitioner.

Like other remedies having a value in excess of those already in use, its advent has been looked upon by some as a "fairy tale," yet this agent is making for itself a place in medicine that no other remedy has been able to occupy.

Chemists tell us that it has been a difficult matter to get the active principle of the gland into a uniform and stable solution, but this seems now to have been satisfactorily accomplished and is upon the market under the name "adrenalin," to which I wish to call the attention of the dental profession.

#### **Composition.**

Adrenalin is composed of one part of the active principal of the gland with 999 parts of a normal salt solution, to which is added 0.5 per cent chlore-tone (according to literature from its manufacturers, Park, Davis & Com-

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pany), thus adding to the properties of the gland those of a germicide and a local anæsthetic equal to one per cent cocaine, as chloretone is ten times as powerful as cocaine.

**Medical Properties.** Adrenalin is a powerful vasomotor stimulant, a hemastatic, astringent and a valuable local anæsthetic.

The latter property is due not only to the presence of the chloretone but to the ischemia it induces.

**Therapy.** Adrenalin is being widely used in surgery in the way of hypodermic injections and as a bath to freshly opened tissue for a threefold purpose. First. Either alone or in combination with other reagents as a local anæsthetic. Second. To render the field of operation comparatively bloodless. Third. As a cardiac and respiratory stimulant, thereby lessening the dangers of shock, syncope and drug poisoning. It also finds many uses in the various inflammatory diseases of and hemorrhages from mucous membrane and tissue where capillary congestion exists.

**Uses in Dentistry.** For some months past the writer has been experimenting with adrenalin to see of what service this newcomer can be to the dental profession and I have developed some facts which will seem when first read as very extravagant statements, but they are of such easy and certain demonstration that any dentist can prove their truth upon first attempt. All the uses mentioned in its therapy, of course, are of value to a dentist and one can easily transfer these to his specialty, but adrenalin has some special uses which I have been able to get and which are of great value.

**Painless  
Pulp  
Extirpation.**

Chief among these is in pulp extirpation. By the combination and method given below any dentist can make the application and completely remove the pulp from any tooth under any and all conditions for any person, even a child, in from 60 seconds to three minutes without pain or feeling on the part of the patient. The above is a very strong statement, but I have promised to prove this at the Nebraska State Dental Association May 19 to 21, and I stand ready to do the same at any other similar meeting. Two or three attempts on the part of any dentist will make him a convert and cause him to put his arsenic on the shelf.

**Method.**

Apply the dam if possible and dry the cavity. If pulp is not exposed but covered with a layer of softened dentine, apply first a drop of adrenalin, then one drop of a 40 per cent solution of formaldehyde. If quite a distance from the pulp, use slight but continued pressure with a rubber plug for a few seconds. You can now excavate to complete or near exposure painlessly.

You are now where we all usually make our application of arsenic for devitalization and are ready to begin with the operation.

Apply to the cavity one drop of adrenalin (best applied by capillary attraction) taking some up in the operating pliers. Lay in the cavity a few crystals of cocaine or a small 1/6 grain soluble tablet. Apply one drop as above of a 40 per cent solution formaldehyde. Apply pressure with a rubber plug, at first very lightly but steadily, with not enough pressure to cause patient any pain, gradually increasing the pressure until the end of forty to sixty seconds you are kneading the rubber into the cavity with burnishers with all permissible force, none of which should cause your patient any pain. Now remove covering to the pulp chamber and pass broach slowly towards the apex. If there is a tendency to much hemorrhage or patient should feel in the slightest degree any movements of the broach, repeat the method again, being sure not to omit the formaldehyde. At the close of this you can remove the pulp of any tooth without the patient feeling the operation, and in cases where the tooth is slightly sore to percussion, as in the advanced stages of pulpitis, the soreness will have disappeared, as many times I find that the periodontal membrane has lost its tactile sense. In cases of large apical foramen where you are bothered with hemorrhage, again apply the adrenalin only, with pressure, for fifteen seconds, and not another drop of blood will be discharged. Those who will may proceed with root filling. I prefer to dress the root with a non-irritant dressing (campho-phenique) for twenty-four hours and then fill.

The advantages of the above are: First, it is painless; second, it saves time; third, the color of tooth is never changed; fourth, the after soreness is slight and many times wanting; fifth, your application is a powerful antiseptic.

The part that each ingredient plays is apparent, but the space allotted to me prohibits further details. Again, it is essential that the above be used in the order given or only partial success will result, as the adrenalin must be applied first to contract the pulp, thus drawing it away from the exposure to prevent pain. On your first making pressure you can use a rubber plug, or beeswax, or a patent rubber cup which is on the market as you prefer. I prefer vulcanite rubber.

As an agent for sensitive dentine adrenalin  
**For Sensitive Dentine.** alone, with or without pressure, will render the dentine so that it can be excavated without pain in every instance if applied until pulp is affected, but I have been afraid of its effect upon the pulp and have used it generally without pressure, which renders about nine out of ten painless. I have as yet had no deaths of



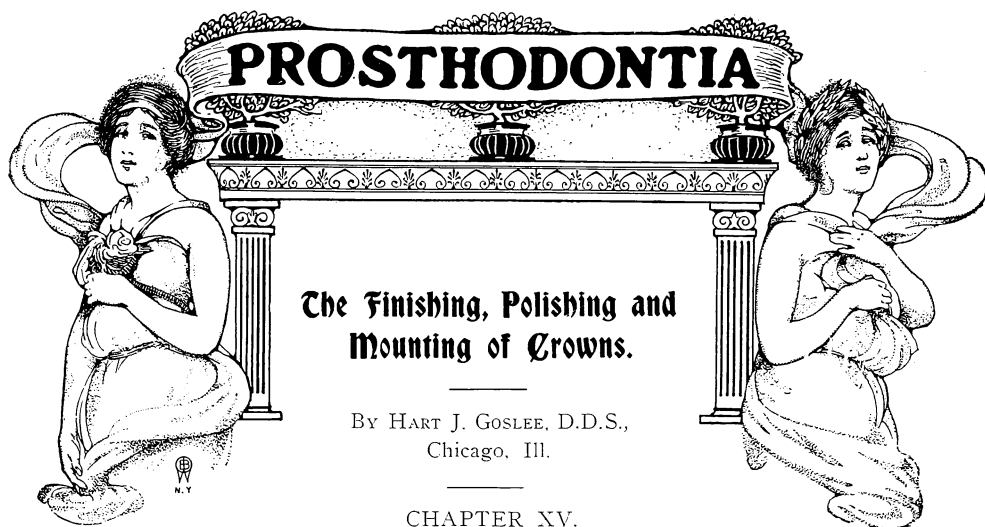
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the pulp following such use. But it is certain that it has a greater action in this direction than any other agent advocated.

**For Extraction.** The following will render more nearly painless the extraction of teeth, and surgical operations about the mouth than any method with which I am familiar, and I have used nearly all such preparations:

Put in a small dish three or four drops of adrenalin and a  $\frac{1}{5}$  grain soluble tablet of cocaine which will make a solution. Add to this twenty drops of hammeilis (this fills an ordinary syringe). Inject in parts to be lacerated. You are ready to operate in two minutes. You have here a pure, fresh antiseptic solution antagonistic to inflammation. I am not in the least afraid of rather large doses of a fresh solution of cocaine, but the reader will please remember that adrenalin is the most powerful antidote known, for cocaine poisoning, and is indicated hypodermatically in all the symptoms which arise in cocaine poisoning, whether that drug has been given or not.





Finishing. Polishing: Facilitating Procedure. Precautions. Gold Plating. Cyanide Solutions, Prepared Solutions. Mounting: Preliminary Adjustment; Temporary Mounting; Permanent Mounting; Use of Cement; Procedure; Dowel Crowns, Shell or Telescope Crowns, Two or More Crowns, Insuring Accuracy of Adaptation to Root, Therapeutics. Use of Gutta Percha; Advantages, Disadvantages, Procedure; Dowel Crowns, Shell or Telescope Crowns, Final Mounting. Combining Cement and Gutta Percha; Procedure. Variations of Procedure; Use of Chloropercha; Use of Shellac and Sandarac; Rubber Tissue. Final Precautions. Removing Crowns Mounted with Gutta Percha.

The finishing, polishing and mounting of crowns, while almost equally as important as any other special portions of the work, are, nevertheless, quite often neglected or done in a more or less perfunctory manner, because of not being fully appreciated.

This should not be so in any single instance, for the reason that proper *finishing* and *polishing* adds materially, not only to the artistic appearance, but also, and particularly where gold is used, to the increased hygienic condition presented in the finished piece; and successful *mounting* has much to do with the degree of comfort and permanency of the operation.

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### Finishing.

When the case has been removed from the investment, it should first be treated to the acid bath for a sufficient length of time to insure the thorough removal of all products of oxidation, and of all particles of investment material and "flux." After this has been effectually accomplished, the acid should be thoroughly removed by washing freely with clean water, and the case then finished in accordance with the requirements, and with the maximum of artistic possibilities to which gold and platinum are so highly susceptible, as is evidenced in the jeweler's art, and in jeweler's products.

The primary efforts in finishing should consist in obtaining the required contour; the desired obliteration of all joints, and evenness and smoothness of the surfaces; and should include removing, or diminishing any undesirable or unnecessary display of metal upon any surface. Owing to the small size of the piece, this may usually be best accomplished with small carborundum stones, of coarse and medium grit, used in the engine. These should be followed with emery or sandpaper disks



*Fig. 215.*

of medium grit, and subsequently with very fine, or cuttlefish, disks, until every scratch is removed, and the surfaces are perfectly smooth.

A more finished and artistic appearance may be given to the lingual surfaces of anterior crowns with gold backings by making an effort to reproduce the natural shape and form of this surface in the gold (Fig. 215), which may be easily and quickly done with a knife-edge carborundum stone, and plug-finishing burs.

### Polishing.

This should then be followed by highly polishing the metal with felt and brush wheels on the lathe. The primary polishing should be obtained with a thin-edge felt wheel (Fig. 216) and moistened pumice stone of medium grit; and the wheel should be previously soaked in water, so that it will absorb and carry the pumice stone with it during the procedure.

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When the desired smoothness of surface has been thus obtained, the final polishing should be given first with a stiff brush-wheel (Fig. 217a), used with the pumice stone, and then with moistened whiting, or precipitated French chalk; and this should be followed with a *soft* brush-wheel (Fig. 217b) and whiting, and finally with a cotton "buff" wheel (Fig. 217c) until a highly polished and mirror-like surface presents.

Such a finish requires but little effort and but a few moments' time and is always indicated because of the more artistic appearance of the work, and of its being thus rendered more hygienic. The more highly the surfaces of metal are polished, the less susceptible are they to discoloration, and the more permanent and self-cleansing is the finish, be-

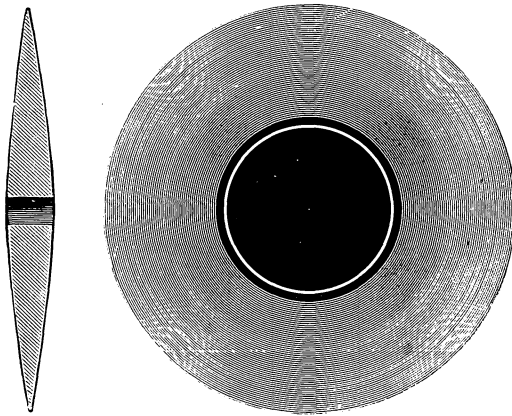


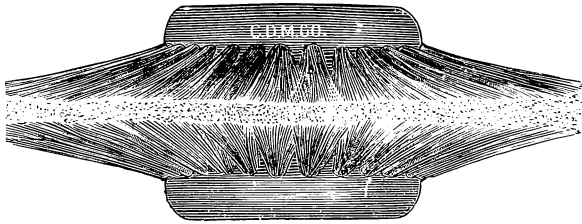
Fig. 216.

cause less opportunity is thus afforded for the subsequent attachment of accumulations in the mouth.

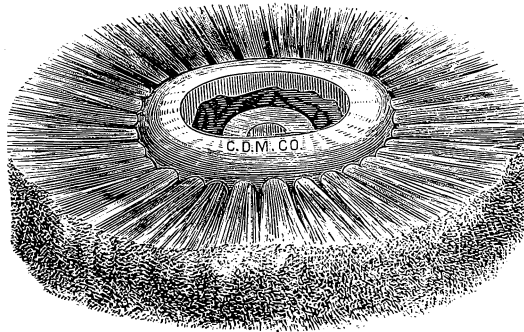
Jewelers' rouge and various other polishing compounds are often advocated and are employed with the "buff" wheel for the final polishing, but nothing seems to produce better results than whiting, if properly used, as indicated; and the reddish color imparted by rouge to the metal, together with the discoloration of the fingers incident to its use, are more or less objectionable.

As single crowns, and particularly those of the **Facilitating Procedure.** "shell or telescope" variety, are somewhat difficult to handle while polishing, various styles of "crown-holders" have been devised for facilitating this part of the work.

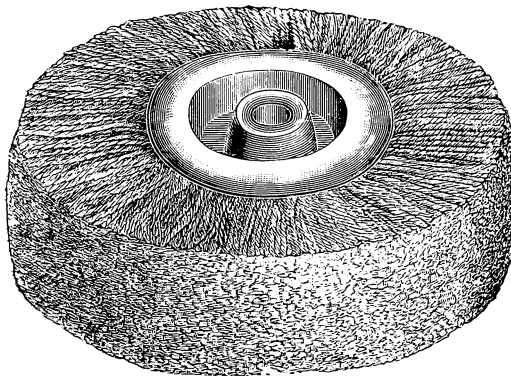
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*a*



*b*



*c*

*Fig. 217.*

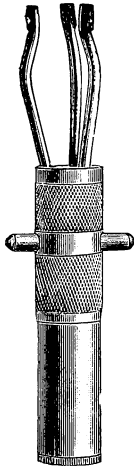


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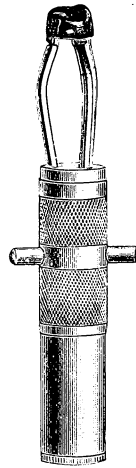
The most ingenious and perhaps universally useful of these instruments is the one known as Fahey's Ideal Crown Holder, manufactured by the Dental Specialties Company, of Chicago (Fig. 218). This is adaptable to any size of crown, because of one blade being removable; and, the spring being adjustable, it holds the crown securely with little or no danger of distorting its shape.

A similar device which is also useful for this purpose is known as the "Place" crown holder, and is shown in Fig. 219.

The filling of the crown with compounds of sealing wax, and then inserting a piece of wood into it while it is hot, is sometimes recommended, but is objectionable because of the difficulty of removing the



*Fig. 218.*



*Fig. 219.*

compound after the polishing is completed; and the fitting of the end of a piece of wood of suitable length to the interior of the crown is likewise a poor method, because of the possible distortion of the shape of the band in so doing.

While dowel crowns are not quite so difficult to handle in the polishing, the use of one of the pin vises previously recommended may sometimes be found convenient.

### **Precautions.**

Although it is scarcely possible to give too high a polish to the exposed surfaces of metal which are to be permanently fixed in the mouth, it is, however, quite possible, and indeed sometimes quite easy, to polish through the

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thinner portions of a crown in the use of disks and felt wheels; hence, in polishing, extreme care should be exercised to prevent such a mishap, as well as to preclude any unnecessary thinning of such parts.

### Gold Plating.

An increased artistic effect, and a more permanent finish, may be obtained by subjecting the piece to the electroplating process, *after it has been highly polished*. This imparts a uniform rich yellow color to all metal surfaces and affords a surface of pure gold which is more or less permanent, and which is not so easily attacked and discolored by the chemical action of the secretions.

Solutions for this purpose may be made by dissolving fifteen grains of the chloride of gold in a porcelain or glass vessel containing about four ounces of distilled water, and then adding to this a like amount of water into which about thirty or forty grains of pulverized potassium cyanide has also been previously dissolved in a similar vessel. This is known as the "*cyanide solution*," the approximate formula for which, as generally employed, is as follows:

Chloride of gold	gr. xv.
Cyanide of potassium	gr. xxx. to xl.
Distilled water	oz. viii.

A small ordinary "primary" or "dry cell" battery may be used, and the work to be plated should be attached to the *negative* pole and then suspended in the solution, with a piece of thin pure gold plate likewise suspended from the *positive* pole, *avoiding contact* between the two.

If the piece is *well finished* and *highly polished*, and then washed with bicarbonate of sodium to remove all traces of organic matter, and then fastened to the pole by so coiling the wire as to have a well-distributed contact over the surface of the metal to be plated, a few minutes' immersion in the solution will afford the desired result, after which it should be again highly polished with the "*buff*" wheel.

Solutions which may be used without a battery

**Prepared Solutions.** are prepared for this purpose, and while they seem to afford good results, the deposit of gold is probably not so heavy, and hence not so permanent, and the solution can only be used until it becomes inactive.

In their use a sufficient quantity of the solution should be placed in a porcelain or glass vessel and heated until *warm*, and the work then attached to a strip of *pure zinc* and immersed therein.

Moderate heat and slight agitation will effect the desired result in a few moments, and the permanency and effectiveness of the solution may

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be increased by suspending a small piece of pure gold plate on another zinc strip hooked over the edge of the vessel so that the gold is immersed.

### Mounting.

No portion of the entire procedure incident to the construction and application of the work is of more importance than the detail involved in its secure and permanent attachment to the root.

In order that such a fixation may be secured with reasonable facility, the medium used must possess sufficient plasticity to admit of the proper and accurate adjustment of the crown, and to completely fill the intervening space between it and the root, and must then afford a substantial and more or less insoluble and impervious union between the two.

#### **Preliminary Adjustment.**

Previous to any effort toward permanent mounting, the crown should *always* be adjusted to position on the root, as a means of ascertaining with absolute certainty that it meets with all the requirements of fit, occlusion, etc., as well as to admit of making any changes in its form or shape which may be necessary, and of subsequently repolishing, which can never be done so well after permanent fixation is secured.

The adjustment may be greatly facilitated in so far as discomfiture to the patient is concerned by slightly moistening the interior of the band with 95 per cent carbolic acid, or by *carefully* bathing the gum surrounding the root with a two or a four per cent solution of cocaine just previous to inserting the crown.

The former procedure is perhaps the more simple, equally effective and less dangerous one, and usually affords sufficient anesthesia of the parts to admit of the subsequent permanent mounting without any appreciable discomfiture; and any possible escharotic effect may be overcome by bathing the tissue with alcohol as soon as the crown is forced to place.

The driving of the crown to position is never warrantable or necessary if the adaptation is anywhere near correct; anterior crowns can usually be forced to place with the fingers, and a firm closure of the jaw will aid in adjusting those on the posterior teeth. In the event of the absence of occluding teeth, a small flat piece of wood may be used to advantage here, as indicated in the fitting of bands.

When it has been observed that the adaptation is correct, the crown should be then removed and mounted, as the patient should never be dismissed, *no matter how firm it may remain in place at first*, without the presence of some medium of attachment which may preclude its becoming loosened, and any possible distortion of the fit or shape which might result therefrom in wearing, not overlooking the danger of swallowing it.





### Temporary Mounting.

In the event of permanent mounting being contraindicated for a time, the crown may be temporarily mounted in a manner which will admit of its being worn without danger of becoming loosened or distorted in shape, and of its being removed with facility whenever necessary.

When such a procedure may for any reason be indicated, *temporary stopping* will serve as a sufficiently substantial medium to afford attachment from sitting to sitting, or for a few days' duration, but it does not possess sufficient integrity to be reliable for any great length of time.

In its use, the root should be dried with alcohol and hot air, and a sufficient quantity *thoroughly heated* and placed inside of the band, and the crown then quickly forced to place, after which it may be chilled with a spray of cold water directed upon the crown, and the surplus then trimmed away.

Crowns so mounted may be easily removed with a pointed instrument, hooked over the edge of the band, as heat higher than the temperature of the body is scarcely ever necessary to destroy or reduce the adhesive property of this material, which accounts for its not being reliable for more permanent usage.

### Permanent Mounting.

The requirements of a permanent mounting are best obtained at the present time in the use of the oxyphosphate of zinc cements and gutta percha. Amalgam was formerly used to some extent but has been practically abandoned in view of the greater facility with which either of these may be successfully employed.

### Use of Cement.

Cement is perhaps the more generally employed because of the facility with which it may be manipulated, combined with its adhesive properties and inherent strength when moisture is excluded.

The disadvantages incident to its use are the temporary irritation to the tissues in mounting; the possible more or less permanent irritation which may be induced by hidden particles accidentally left in contact with the gum after mounting; its susceptibility to dissolution when exposed to the action of the secretions; its possible shrinkage in crystallizing, and the extreme difficulty with which a crown may be removed, and particularly a dowel crown, when occasion demands.

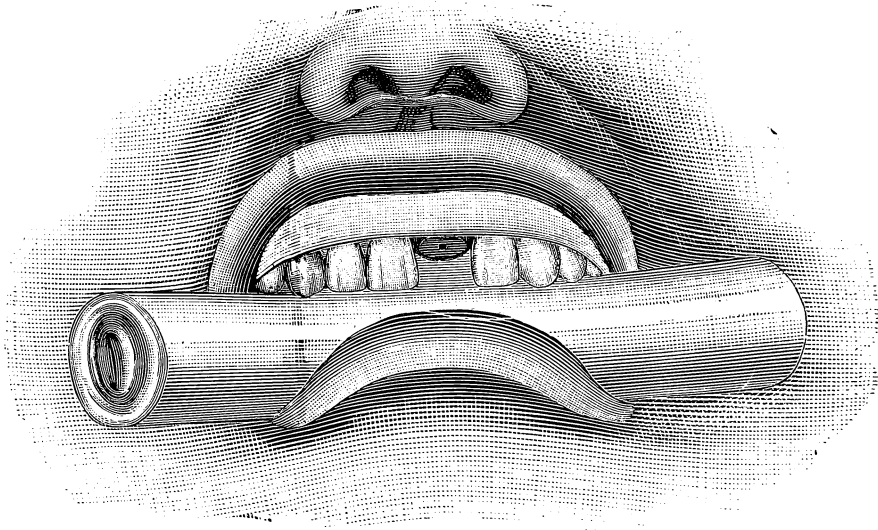
When it has been ascertained that the adaptation is correct, and when the crown is ready to be permanently mounted, its inner surface should be cleansed with alcohol, and thoroughly dried with hot air.

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The root should now be *rendered aseptic* by a careful bathing with carbolic acid, or by the use of pyrozone or hydrogen peroxide, or any good antiseptic, and then thoroughly dried with pledgets of cotton.

Thorough drying is *absolutely essential* and may be facilitated by precluding contact of the lips, cheeks, or tongue, with cotton rolls or pads, and then using alcohol or chloroform evaporated with compressed air, or warm air from the chip blower. The non-absorbent cotton rolls prepared in various sizes and lengths by Johnson and Johnson are very convenient for such purposes. The use of these in the anterior part of the mouth



*Fig. 220.*

is illustrated in Fig. 220, and if the root is in the posterior part of the mouth, a "mouth prop" adjusted in the opposite side to hold the mouth open will often be found very useful, and the cotton rolls may be effectively retained with a clamp adjusted to an adjacent tooth. Fig. 221.

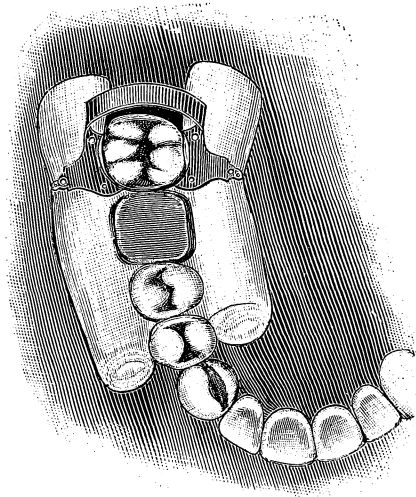
A good reliable medium setting cement should now be mixed to a creamy consistency, which should, and can best, be done by an assistant, when possible, in order that the operator may confine himself to observing that the root does not become moistened.

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### **Dowel Crowns.**

If the crown possesses a dowel, the canal, or canals, should first be thoroughly filled with the cement. This may be accomplished by using a root canal plugger and a pumping action, until the cement has been carried to the extreme ends. A cement syringe for this purpose has been devised by Dr. H. L. Cruttenden, but its use usually involves more time than is necessary or warrantable for such a simple procedure.

When the canal has been thus well filled, the dowel and interior of the cap should be coated or covered with a layer of cement, which, if done by the assistant during the filling of the canal, will greatly expedite



*Fig. 221.*

the operation, and the crown should then be quickly and firmly pressed to its proper position on the root.

After becoming assured of its having assumed the proper relation, the patient may be requested to close the mouth until the cement has at least partially crystallized, the length of time required for which will be indicated by the surplus remaining upon the mixing slab. It is desirable that the first stages of the setting of the cement should be obtained under pressure. Therefore the operator should press firmly upon the crown with a piece of soft wood for at least five minutes.

The crystallization may be hastened somewhat by directing warm air from the chip blower upon the crown, and when sufficiently hard, all

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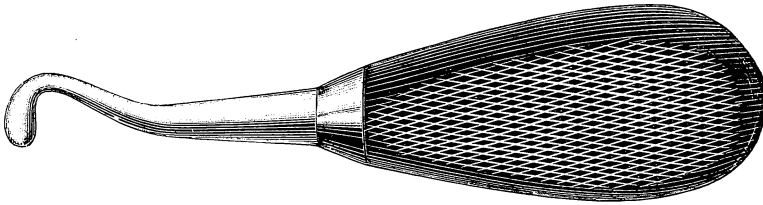
surplus should be carefully removed with pledgets of cotton, and a sharp-pointed explorer passed carefully around the band beneath the gum.

A ligature drawn through the interproximal space may further insure the removal of any remaining surplus at these points, which precautions are always advisable, because of the extreme irritation to the gum which is produced by such hidden particles after their complete crystallization.

Coating the outside of the band along the cervix with vaseline or oil just previous to mounting is recommended as a means of facilitating the removal of the excess by preventing its adhering to the edge or surface of the crown.

In mounting the "shell or telescope" crown, the same detail is indicated, but as a larger quantity of cement must be placed in the crown, care should be exercised to have it cover all surfaces, and be devoid

**"Shell or  
Telescope" Crowns.**



*Fig. 222.*

of air spaces, in order to insure the complete filling of the entire intervening space between it and the root. The proper quantity is governed, of course, by the length of the root which projects or extends into the crown.

As soon as the crown is forced to place, the mouth should be immediately closed and the occlusion observed, and when this is as it should be, which will be indicated by the normal contact of the adjacent opposing natural teeth, a roll of cotton should be placed between the crown and the opposing teeth, and a steady and firm pressure of the jaw in normal occlusion maintained until the cement has crystallized, in order to prevent any possible displacement.

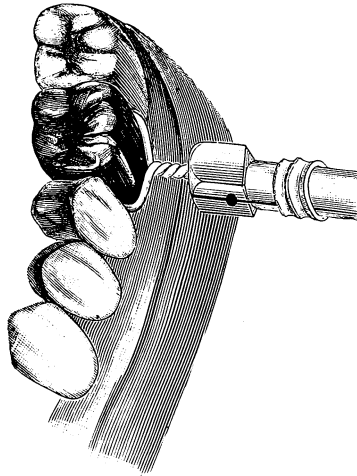
The same precautions incident to the removal of all excess cement should then be observed with equal care, and before dismissing the patient it should be carefully and finally noted that the crown *does not occlude too hard*, as subsequent discomfiture will invariably result if this condition exists.

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**Two or more Crowns.** When two or more crowns are to be inserted at the same sitting, *each should be mounted separately*, as the crystallization of the cement seldom affords opportunity for the thorough and accurate mounting of more than one with each mixing; and the operator should never be hurried, nor make any effort to expedite matters to too great an extent in this procedure.

**Insuring Accuracy of Adaptation to Root.** If any doubt exists as to the accuracy of the relation of the cervical edge of the crown to the periphery of the root, some means of insuring a close joint between them should be observed.

This may often be aided materially by slightly reducing the circumference of the edge of the band with curved or small, pointed pliers, just



*Fig. 223.*

previous to the final mounting, as it may have become somewhat enlarged, by stretching, in the fitting and preliminary trials.

The use of a smooth foot plugger adjusted to the automatic mallet may also be found useful, and particularly along the buccal edge, after the crown has been mounted; and the approximal edges may be brought into closer contact by inserting a small amalgam burnisher into the interproximal spaces, and exerting some little effort in this direction. Either a suitable burnisher, such as is illustrated in Fig. 222, or the foot-plugger, may often be employed to good advantage upon the lingual surface, but in the use of either, some little care should be observed to avoid produc-

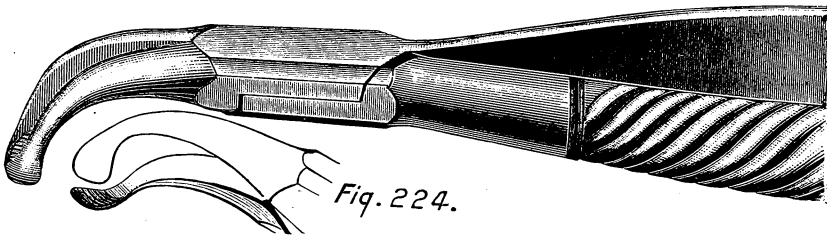


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ing sharp angles at the corners, and yet to secure a close adaptation and particularly at the bifurcation of the roots.

In extreme cases of ill adaptation or of exceedingly constricted necks, a good result may often be obtained by encircling the crown with a piece of German silver, or copper wire, from 24 to 26 gauge, passed through the interproximal spaces, and the ends then twisted from the buccal side (Fig. 223), until the loop breaks. This affords a uniform compression of the edge of the band by condensing the molecules, but in effecting it, it should be observed that the wire does not slip beneath the edge of the band, which tendency may be overcome by slightly *flattening* that portion which rests against the *lingual* surface of the crown, or which forms the center of the loop. While ordinary silver suture wire, or that made from other alloys or metals may be used, those recommended give the best results, because of their tensile strength.

Wherever possible, all of these procedures should be observed, or executed, after the crown has been properly mounted, and a firm closure



of the jaw should be maintained, in order to prevent lifting it from its proper relation. The cement should first be allowed to become partially crystallized, also, in order that any slight hemorrhage produced may interfere as little as possible with its perfect crystallization.

An instrument designed for compressing the edge of the band after mounting has been devised by Dr. Rudolph Beck, of Chicago (Fig. 224), and may sometimes be found more or less useful for this purpose.

In cases of extreme pain after mounting, which is sometimes induced by the irritating influence of the cement upon inflamed or hypersensitive tissues, but which is usually only temporary, relief may be afforded by painting the gums around the neck of the crown with a two or a four per cent solution of cocaine; or with the tincture of iodine, or the usual remedies for counter-irritation. A spray of hot water is also sometimes very

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effective, and where an astringent may be indicated, in cases of congestion, zinc sulphate or a saturated solution of tannic acid in glycerine may be employed.

### Use of Gutta Percha.

The difficulty encountered in the removal of crowns mounted with cement, and particularly of dowel crowns, has created a demand for some medium which would afford a secure and reliable attachment, and which would at the same time admit of subsequent removal in the event of necessity, without requiring the destruction of the crown or of any appreciable amount of tooth structure.

The ordinary *red or pink base-plate gutta percha*, skilfully manipulated, seems to meet such requirements in admitting of easy removal, as well as to possess the additional desirable qualities of offering sufficient integrity in the attachment, and of being insoluble, non-irritating, and more or less impervious.

Its use also affords a somewhat cushion-like seat for the crown, which is an advantage because of relieving the "deadened blow" in the stress of mastication, and of thus reducing the shock, and diminishing the tendency of porcelain to fracture, as compared with a more non-yielding medium.

The disadvantages incident to the employment of this material lie mainly in the skill and time required to successfully manipulate to refractory or intractable a substance; and yet its integrity as a substantial mounting is due to such properties, and will, of course, increase in proportion thereto, so long as it is capable of being rendered sufficiently plastic to be properly moulded, in the adjustment of the crown.

While its employment is probably more especially indicated for dowel crowns, this same essential property may here prove a disadvantage, if any great surplus is present, by offering sufficient resistance to expand the band, and thus destroy the accuracy of its adaptation.

This objection may be overcome, however, by careful manipulation in obtaining the maximum of plasticity, and avoiding the presence of any unnecessary surplus. Successful results will depend upon a willingness to consume time, and to observe the detail with deliberate painstaking care, as well as in the acquirement of the necessary degree of skill; and will increase in proportion thereto.

In its manipulation, the material should be cut into narrow shreds or strips, from one-half to one inch in length, and these should then be slowly and

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carefully heated until plastic. The heating should be done at the chair, and may be best accomplished by placing them on a porcelain-lined electric gold annealer, such as is manufactured by Mr. M. M. Kerr, of Detroit, Mich.; or upon a mica slab placed over a flame, where they should remain until the mounting is completed. The Custer electric gold annealer has an accompanying porcelain slab which may also be used for this purpose.

Direct contact with the flame should always be avoided, as this destroys the working properties of the material by rendering it harsh and tough.

While the gutta percha is being thus heated, the dowel of the crown should be spurred with a sharp knife-blade, and it and the interior of the cap then slightly moistened with a solvent of gutta percha, to facilitate a secure attachment. Oil of cajeput is probably the best solvent for this purpose, though oil of eucalyptol or chloroform may be used.

When thus prepared, a piece of the gutta percha should be picked up with foil carriers, coiled around the dowel from its apex downward, Fig. 225a, and then packed down closely with the fingers. If one piece does not appear to be sufficient for the first trial, another may be added, until what seems to be adequate is obtained, a surplus should be avoided.

The crown should now be placed upon the heater, and the canal and end of the root then moistened with a spray of water from a syringe, in order to prevent the gutta percha from adhering, after which the heated crown may be grasped with a napkin and forced to position. If no great surplus has been used, it will go readily to place without driving, when it should be at once removed, and small pieces of the heated material added, where needed; it is then placed again upon the heater, the root moistened, and this procedure continued until the gutta percha is moulded to fill the space between crown and root, when the correct relation exists.

All surplus should now be trimmed off even with the edge of the band, and the crown then replaced upon the heater.

In the event of the presence of too much gutta percha to admit of the proper adjustment, the surplus should be trimmed away with a hot instrument, and the crown reheated and carried to place, until the proper relation maintains.

The procedure indicated in the mounting of the "shell or telescope" crown is the same, except that the gutta percha may be cut into small square pieces, of convenient size; and these should be placed in the bottom of the crown and around the joint between cusp and band, until they may be gradually moulded to fill the space.

**Shell or**

**Telescope Crowns.**



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**Final Mounting.** Up to this point, the root should be moistened previous to each application or trial of either style of crown, in order that its removal may be made easy by preventing adhesion.

When ready for the final mounting, the crown should be again placed upon the heater, and allowed to remain until the root has been rendered aseptic, and then thoroughly dried in the manner indicated in connection with cement. It should now be moistened with the oil of cajeput, or with a thin solution of chloropercha, and the crown then picked up with the napkin, and forced to place, where it should be held firmly for a few moments, until the gutta percha loses its heat, which may be hastened by a spray of cold water.

### Combining Cement and Gutta Percha.

While either cement or gutta percha may be used in mounting shell or telescope crowns, on the posterior teeth, the advantages of both may be obtained for dowel crowns by combining them. This may be done in such manner as to admit of the subsequent removal of the dowel, in case

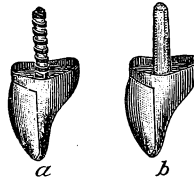


Fig. 225.

of accident or necessity without any great difficulty, and to overcome any possible danger of enlarging the band, such as may possibly result from the use of gutta percha alone.

Whatever advantages cement may possess as a mounting medium, it is seldom the best practice to *surround the dowel* exclusively with this material, because of the extreme difficulty of ever removing it from the root. Hence, if one is not sufficiently skilled in the manipulation of gutta percha alone, some means of facilitating the removal of such crowns, without injury to the root, is always indicated.

This may be accomplished by using sufficient **Procedure.** gutta percha, in the manner described, to surround the dowel only (Fig. 225B) and then completing the mounting by filling the cap and coating the walls of the canal with cement, thus obtaining, in a measure, the advantages of both, with the minimum of the objections of each.

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## Variations of Procedure.

The skill required to successfully manipulate gutta percha has caused the adoption of several variations of procedure, each with a view of accomplishing the desired result with greater facility and expediency.

A thick solution of gutta percha in chloroform **Use of Chloropercha.** is sometimes employed for the entire mounting of dowel crowns, but is not recommended, because of the shrinkage of such medium, due to the evaporation of the chloroform. This shrinkage will, of course, afford some opportunity for the subsequent loosening of the crown, and thus diminishes the stability and permanency of the attachment.

It may be used around the dowel and on the inner surface of the cap, however, in place of the base-plate gutta percha, and when so employed, the chloroform should first be evaporated by passing over a flame, and the crown then mounted with cement, as indicated. This prevents the adhesion of the cement to the surfaces of the dowel and cap, which, of course, facilitates the removal of the crown, but not to the extent afforded by the use of the gutta percha alone, when it entirely fills the canal.

A heavy coating of very thick shellac or sand-  
**Use of Shellac**      arac varnish over the dowel, and on the inside of the  
**or Sandarac.**      cap will also prevent the adhesion of the cement to  
the metal, and thus facilitate the removal of the  
crown, and particularly of the dowel; and while it is better to use either  
one of these alcoholic solutions than nothing at all, their similar employ-  
ment only affords the same advantages and limitations mentioned in con-  
nection with the use of chloropercha.

A preparation of rubber in the form of very  
**Rubber Tissue.**      thin tissue, which is quite adhesive, is recommended  
for similar use by Dr. W. F. Lawrenz, of St. Louis,  
but at the present stage of its experimental application, it seems to offer  
no particular advantages over the preceding materials, and is more diffi-  
cult to manipulate.

## Final Precautions.

When the mounting has been completed with apparent satisfaction, the patient should never be dismissed until it has been carefully ascer-  
tained that the crown is firm, and that the occlusion and all surrounding  
conditions are favorable; and a further precaution against any possible  
subsequent displacement, annoyance or discomfiture should be observed  
by requiring the patient to return in the course of a few days for final  
inspection.



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### **Removing Crowns Mounted with Gutta Percha.**

The removal of crowns mounted with gutta percha may be easily effected by applying sufficient heat to the exposed portion of the crown to soften the material. This may be done by heating the beaks of a pair of heavy pliers of good size, placing them on the crown, and sustaining the contact until the heat is conveyed throughout its length, which will usually be noted by a response from the patient, when the gutta percha surrounding it will be sufficiently softened to lose some of its adhesive properties, and admit of the ready detachment of the crown with a hooked or pointed instrument.

In this procedure, care should be exercised to guard the face and lips of the patient, as well as to protect the porcelain, which may be aided by cotton rolls or pads; and the pliers should be heated in the laboratory, or where the heating may not be observed by the patient, and then carried to the chair wrapped in a napkin or towel, with only the beaks exposed, as a matter of convenience to the operator, and of protection and relief from fear to the patient.

A more convenient method which may sometimes be employed with success has been suggested by Dr. C. B. Rohland. This consists in placing a leather or moose-hide polishing wheel in the engine and revolving it with rapidity against the crown until the friction will thus produce sufficient heat to admit of its removal.

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## **Experiments in Vulcanite to Test Contraction and Warpage.**

By STEWART J. SPENCE, Chattanooga, Tenn.

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To test whether vulcanite contracts or expands  
**Experiment 1.** in cooling, red rubber was rammed into a glass cylinder and then vulcanized. *Result:* The plug was quite loose in the cylinder. Vulcanite contracts.

The glass cylinder being found inapt for measuring the extent of contraction, the following device was employed:

Of common tinned sheet iron was made a little  
**Experiment 2.** box in size  $3 \times \frac{1}{2} \times \frac{1}{2}$  inches, into which was packed red rubber, which was vulcanized. *Result:* The strip of vulcanite came out slightly contracted, so that two thicknesses

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of paper could be inserted between it and the end of the box; this being about 0.15 millimeter of space. But suspecting that contraction had not been free and uncontrolled, because extruding portions of the rubber had become entangled with the wire which had bound the lid on the box, there was made:

The above mentioned strip of vulcanite was  
**Experiment 3.** filed down so that it would lie loose in the box and together they were again run through the vulcanizer (at 320° F. for an hour and a quarter). *Result:* The space between vulcanite and box, at their ends, was increased to 1.5 millimeters, about one-sixteenth of an inch.

This astonishing result made it evident that were it not for the restraining effect of the plaster investment, every vulcanite plate would contract so as to be utterly unwearable. To test the effect of a powerful restraint, there was made:

The iron box was again packed full of red  
**Experiment 4.** rubber, in which was embedded a serrated bar of iridiumoid, and the case was vulcanized for two and one-half hours at 300°. *Result:* No contraction. Then it was again vulcanized at 300° for two and one-half hours; again at 315° for one hour; at 320° for one hour and lastly at 330° for one hour, by which time it showed a very slight contraction, about 0.3 millimeter. Had the bar extended the full length of the rubber, probably there would have been no space at all. This experiment proved that the contraction of vulcanite can be prevented.

To determine at what degree of heat this contraction of vulcanite commences and also by what degrees it progresses, there was made:

Red rubber was packed in the metal box, slightly overflowing it so that some rubber would extrude and thus prevent shrinkage during the first vulcanization, and this was put through the vulcanizer for one hour at 320°. *Result:* It came out, as expected, showing very little contraction, about one thickness of paper of space. It was then placed in heated water, the temperature of which was gradually raised as follows:

- |      |                      |   |
|------|----------------------|---|
| 120° | for five minutes.    | No increase of space.                   |
| 130° | " " "                | Almost imperceptible increase.          |
| 140° | " " "                | Space of two folds of paper.            |
| 150° | " " "                | Space of three folds of paper.          |
| 160° | " " "                | Space of four to five folds of paper.   |
| 170° | " " "                | Space of seven to eight folds of paper. |
| 212° | for one-half minute. | Space of fourteen folds of paper.       |
| 212° | for five minutes.    | Increase slight, if any.                |



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As fourteen folds of this paper measured about 1.0 millimeter, the shrinkage of three inches of vulcanite at boiling heat was seen to be about 1.0 millimeter.

The writer believes that this experiment affords valuable data for the reduction of the size of over large vulcanite plates. He recommends the immersion of the plate in water at 140° for about a half minute, then trial in the mouth; if gain has come repeat the attempt at 150°, and so on till increase of adhesion ceases. The passing beyond the point of strongest adhesion if but slight need not be dreaded, for the absorption of the ridge under the undue pressure, thus induced, will soon equalize the pressure to the palate.

As a continuation of this series of experiments, the vulcanite strip was placed in the vulcanizer and results were as follows:

300°	for five minutes.	Total space,	1.5	millimeters.
300°	for sixty minutes.	" "	1.8	"
315°	" " "	" "	2.0	"
320°	" " "	" "	2.4	"
320°	" " "	" "	2.5	"
320°	" " "	" "	2.7	"
320°	" " "	" "	1.5	"
320°	" " "	" "	1.0	"

Thus contraction increased until by the sixth vulcanization it had reached the enormous extent of 2.7 millimeters! After that expansion set in.

To determine if other rubbers would act like the red rubber used in experiment 5, there was made the following:

Into four boxes of tinned iron, each about  
**Experiment 6.**  $3 \times \frac{1}{4} \times \frac{1}{4}$  inches, was packed respectively black rubber, weighted rubber and two kinds of red. The black was the uncolored variety; not the jet black. These were vulcanized for two and one-half hours at 300° F. and when opened and freed by filing from the extruding portions which, as previously explained, prevent contraction at first vulcanization, were revulcanized for another two and one-half hours at 300°. *Result:*

Weighted showed space of 0.8 millimeter.

Black showed space of 1.2 millimeter.

Red (a) showed space of 1.2 millimeter.

Red (b) showed space of 1.4 millimeter.

Contrary to expectation, the black rubber showed less contraction than the more adulterated red rubbers.

These pieces were again vulcanized, this time at 315° for an hour.



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## *Result:*

Weighted showed space of 0.9 millimeter.  
Black showed space of 1.2 millimeter .  
Red (a) showed space of 1.4 millimeter.  
Red (b) showed space of 1.8 millimeter.

Again they were subjected to the vulcanizer at same time and heat.

## *Result:*

Weighted showed space of 0.9 millimeter.  
Black showed space of 1.5 millimeter.  
Red (a) showed space of 1.4 millimeter.  
Red (b) showed space of 1.8 millimeter.

Thus all except the black had now come to a standstill. They were once more put through the vulcanizer this time for one hour at  $330^{\circ}$ , when instead of further contraction, they all underwent expansion.

Weighted showed space of 0.5 millimeter.  
Black showed space of 1.3 millimeter.  
Red (a) showed expansion of 4.0 millimeter.  
Red (b) showed space of 1.4 millimeter.

The enormous expansion of Red (a) (three millimeters beyond the length of the box) was quite phenomenal. As, however, it had been placed in the vulcanizer loose (that is, not in its metal box), and as some plaster casts had been put in at the same time, it may have been pressed upon by these casts, which doubtless would increase its length.

Two of these four strips of vulcanite were again treated to  $330^{\circ}$  for three hours. *Result:*

Weighted showed space of 0.3 millimeter.  
Red (b) showed space of 0.0 millimeter.

The weighted rubber, as we see, expanded less and also contracted less than the others. These expanded strips presented a swollen appearance, their previously flat surfaces having become spheroidal. On being broken open they were found honeycombed. It became an interesting question: Will a plate which has been vulcanized at a certain heat contract any further if revulcanized at the same, or a lower, heat? To test this was made:

Red rubber was packed into one of the before mentioned boxes and vulcanized at the high heat of  $330^{\circ}$  for the long time of three hours, with a resulting contraction of 0.8 millimeters. It was then revulcanized at the lower temperature of  $320^{\circ}$  for one hour with the result that the contraction increased to 1.4 millimeters. It was thus demonstrated that revulcanization at even a lower temperature may produce further shrinkage.



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The fact that vulcanite contracts during cooling being thus demonstrated, it follows that warpage of vulcanite plates is caused by unequal contraction, as where the controlling hold of the plaster investment at one side of a plate is stronger than on the other. Warpage, therefore, may be said to result from *unequally resisted contraction*. That it does not result from a mere tendency to curl up, such as may be seen when a piece of rubber is placed on a hot stove, is made evident by the two following tests:

**Experiment 8.** A sheet of red rubber, two by two inches, was vulcanized between two plates of glass, which were feebly held together by a weak elastic band.

*Result:* After vulcanization this band was found so much softened that it exerted no pressure whatever on the plates of glass, and yet they remained in close contact with the vulcanite.

While conducting experiment 5, the strip of vulcanite there used was found slightly bowed up after coming out of the water at 170°. A small elastic band was slipped around it and its box, exerting a very slight pressure on the bowed portion. It was then replaced in the hot water, and soon the bowing disappeared. These two experiments seem to prove that any investment of plaster, if not absolutely mushy, will control the warpage of vulcanite that arises from other causes than contraction.

**Experiment 10.** Vulcanite expands temporarily under heat. One of the before mentioned strips, having about 1.3 millimeters contraction, was, with its metal box, placed over an alcohol flame on a metal slab (an old die-plate for swaging crowns, rescued for the occasion from the innocuous desuetude to which it was long ago relegated) on which was also placed a thermometer. *Result:* When the heat had reached 320°, the strip of vulcanite had expanded to its original length. On cooling, it retracted. This experiment indicates that the contraction of vulcanite occurs during cooling, not during vulcanization.

That vulcanite can be stretched when heated was shown thus: **Experiment 11.** A strip of vulcanite was placed on the above mentioned slab over an alcohol flame, and when warm enough to be pliable, was placed on at both ends. *Result:* Its length was increased 3.0 millimeters.

Let us now pass on to experiments made on plates:

A cast was made with non-expansive plaster of **Experiment 12.** a black rubber gum-block upper full plate, vulcanized about sixteen years ago. This cast was separated from the plate; the latter was immersed in boiling water for five

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minutes. The question was, How much would it contract? *Result:* On replacing the plate on the cast it was only with difficulty that it could be pressed home, and when so pressed there was a space between plaster and plate which admitted thirty-six folds of No. 20 tinfoil.

This would, of course, ruin the fit of any plate ever made. Besides this cast, another means was employed for testing the degree of shrinkage. A bar of steel, three inches long, was pointed at its ends, which were then bent at right angles to its shank. With this little instrument, as with a pair of dividers, marks were scratched on the vulcanite, both from heal to heal and from the posterior borders to the incisors. These showed that after its immersion in the boiling water this plate had shrunk 1.5 millimeter from heal to heal, and 1.0 millimeter from back to front.

Let me here revert to an article by Dr. George B. Snow in Richardson's *Mechanical Dentistry*. He says: "The amount of shrinkage in vulcanite, from cooling after vulcanization, is not generally noticed and provided for as it should be. Plates composed of single teeth do not give trouble from this cause, but full plates on which sections are mounted are often very vexatious from the change of shape they undergo. The contraction of the rubber has the effect of lessening the radius of the arch, drawing the heels of the plate together, thus rendering it a little too narrow to fit the mouth accurately. This has the further effect of elevating the palatal portion of the plate which, when tried in the mouth will usually be found to rock slightly. The shrinkage here alluded to becomes a more serious matter when the plate is revulcanized in course of repairing it. In cooling, a second shrinkage takes place, and its fit, already defective, is made perceptibly worse." Dr. Snow then proceeds to the remedy, heating the plate and stretching it apart at the heels and pressing downward the palatal surface.

I quote these words partly to recall attention to the truth which they contain, and partly to point out certain errors. These latter are, the supposition that only gum section plates contract and warp, and that contraction would throw the palate of the plate up. My experiments with both gum-blocks and single teeth plates indicate that both are liable to warp, the former somewhat worse than the latter. And it can easily be seen that the drawing towards each other of the ends of an arch would force upward its dome only when this drawing together is not caused by contraction of the whole arch; but when it is so caused, the summit of the arch is of course reduced with the rest. Therefore to attempt to remedy the evil by heating the palatal portions and pressing downwards would only make bad matters worse. But if unequal resistance to contraction has occurred, that is, if the teeth on one side have been held more firmly by the plaster investment during cooling than those on the



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other, the contraction becomes uneven, resulting in warpage, one side of the plate dropping away from the ridge. That both these changes of shape (contraction and warpage) occur whether in plates of plain or section teeth is shown by the following:

Four old vulcanite plates were filled, each with  
**Experiment 13.** non-expansive plaster, the resulting casts being then removed from the plates and laid aside to be used afterward for testing their changes. These plates were then further treated as follows:

Plate I. This was a plain-tooth full denture on red vulcanite. It was invested with plaster of paris and then revulcanized at  $320^{\circ}$  for an hour and a quarter. *Result:* No warpage (that is, no uneven contraction), but contracted 0.8 millimeter from heel to heel, and when the above mentioned testing cast was placed in the plate, the space at the dome admitted sixteen thicknesses of No. 20 tinfoil.

Plate II. This was another plain-tooth full denture on red vulcanite. It was invested in a substitute for plaster of paris compounded by the writer, and then revulcanized simultaneously with the above. *Result:* A very slight warpage and contraction from heel to heel, only 0.2 millimeter. This better result with plate II was doubtless due to the superior strength of the investment.

Plate III. This was a gum-block full denture on red rubber. It was filled with the above mentioned hard setting compound, but all the rest of its investment was of plaster of paris. Vulcanized at  $320^{\circ}$  for one and a quarter hours. *Result:* A decided warpage, and more contraction than plate II. Perhaps the greater warpage of this than plate II was due, according to Dr. Snow's theory, to the unshrinking wall of porcelain gum. The absence of the hard setting compound for investment accounts for the greater contraction.

Plate IV. This was a gum-block full denture on black rubber. It was invested entirely in the compound, which, however, was not worked so as to obtain its greatest hardness. *Result:* The contraction from heel to heel was 0.5 millimeter and the space at dome admitted sixteen thicknesses of the tinfoil. This was a bad showing. However, the palatal arch was exceptionally high, three-quarters of an inch above the ridge.

In each of these four cases the investments had been hurried into the vulcanizer while "green" (newly set). To test the virtue of dried plaster was made:

Plate II was invested with plaster of paris and  
**Experiment 14.** this was given a day to harden. *Result:* Plate came out of vulcanizer but little changed. The same

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plate was next reinvested in plaster of paris and vulcanized immediately. *Result:* Contraction from heel to heel was now increased to 0.6 millimeter (an increase of 0.4 millimeter), and one of the heels drooped 0.5 millimeter away from the ridge, and when the testing model was forced home the space at dome admitted twelve folds of the No. 20 tinfoil. This preaches loudly against the use of green investments. But unfortunately we cannot conveniently wait a day for investments to harden, especially with repairs.

A new plate of gum-block teeth was made, a bar of serrated iridiumoid being embedded in its rubber along its posterior border. After vulcanization a model in the non-expansive compound was taken of it, and it was next invested in the same material and immediately placed in vulcanizer. *Result:* Contraction from heel to heel was almost imperceptible and warpage was very slight, the space at dome admitting only three folds of tinfoil; but the distance from back to front had decreased 0.25 millimeter, and there was a space of five folds of tin between cast and plate at the region immediately posterior to the rugæ.

Here was a decided improvement, due largely to the metal bar. The slightly greater space back of the rugæ region would be no objection, affording a sort of relief chamber. But the decrease of a quarter of a millimeter in the postero-anterior direction is more serious. Doubtless this might largely be prevented by another serrated bar lying in that direction. I am impressed that it would be well to generally insert such bars in plates, especially the lower and the very thick, for our plate may go for repairs to some dentist who uses plaster of paris for investments, possibly green at that, and thus become contracted. But as these bars do not prevent contraction at all points of the plate, and as they do not generally exist in the plates coming to us for repair, it is desirable to have a way of preventing contraction by the investment. Of course this could be done, and done very perfectly, by dry vulcanization; for in this method the investment does not soften. Indeed, this would overcome another evil of plaster of paris, the expansion of the model in vulcanization, and, to a great extent, its compression in flask-closing. But dry vulcanization is open to several serious objections. However, for those who feel disposed to try it, I will say that it can best be done, so far as my experiments have taught me, by placing the flask in a little sand in a melting pot over a flame. with a thermometer passed through a hole in the upper lid of the flask and reaching down about half an inch into the investment, in which a hole has been made to receive it. This thermometer will need no watching until the mercury has the 212° mark, at which point it will stand until the moisture has passed off as steam,



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which usually requires about one and one-half hours; after which it must be carefully watched, and the heat must be turned down at about  $270^{\circ}$ , after which it will run up to  $320^{\circ}$ , and perhaps further. Indeed, it is difficult to hold it steady at that point. As heat is very slowly conducted by dry plaster, the lower part of a flask will be hotter than the upper, the lower parts of the plate will consequently be more vulcanized, and the lower portion of the model will be more contracted.

An experiment to test the contraction of plaster of paris under dry heat was made thus: Into the lid of a vulcanizable rubber box, which measures, as we all know, about  $6 \times 3 \times \frac{1}{4}$  inches, was poured plaster of paris, filling it. This cast, removed from the lid, was then placed over a fire in a pot filled with sand, standing on one of its ends, and heated to about  $300^{\circ}$  F. for one hour. *Result*: This slab of plaster contracted over 2.0 millimeters at its hotter end and only about 0.5 millimeter at the cooler one. This proved that dry heat is conducted but poorly by either sand or plaster, and therefore that models subjected to it become warped by uneven contraction. Even if dry heat could be made to equally surround the flask it would most contract the portions of the model nearest the outside.

As these facts make dry vulcanization undesirable, the writer set to the task of perfecting the plaster compound in hardness, that is in post-vulcanization hardness. He so far succeeded that in a test made by filling one-half of a flask with this compound and the other half with plaster of paris, the former showed a post-vulcanization hardness from eight to ten times greater than that of the other, as evidenced by a buck-shot sinking almost its entire diameter into the plaster of paris when the two halves were closed upon it. With this material was then made:

A full denture of gum-block teeth was mounted on wax and invested with this non-expansive, hard-setting plaster. No stiffening bar was used. After two hours the flask was opened and measurements were marked on the plaster with the little instrument previously described. These marks would be transferred to the rubber and so would indicate the contraction if any. *Result*: After vulcanization these measurements were found unaltered. Shrinkage had been fully controlled by the investment, though used "green."

To test if the heat evolved in the operation of polishing is sufficient to cause contraction of a plate, this last mentioned plate was polished on a lathe with revolving sandpaper, pumice or cork and wheel, and chalk, a testing cast of it having first been taken. *Result*: No change appeared. The

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heat evolved by polishing probably never reached  $130^{\circ}$ , at which, as we saw, contraction begins.

This concerned the joints of the last mentioned plate and was conducted at the time it was being made (see experiment 17). After removing wax and before packing the rubber, oxyphosphate of zinc was packed in the joints. Rubber was then dipped in a mixture of alcohol, two parts, and benzine, one part, which by partially dissolving the rubber makes it easy to pack but apt to enter joints. Results were bad. The joints were dark with vulcanite. The plate was then broken up and these teeth were used for making another plate, in which the process differed only in the mode of packing the joints. After waxing up, one incisor block and an opposite bicuspid block were removed, and the four joints thus exposed were packed with creamy cement. Results were excellent, one slight flaw only appearing. Again the plate was broken up and the same teeth reset. This time the joints were left unpacked, but the dissolving mixture was not used. Results were very good. The hard investment had prevented the spreading of the joints, and thus prevented the entrance of the rubber. (To produce very clean joints it is best after grinding to immerse them in nitric acid.)

This last mentioned plate was filled with non-expansive plaster and a cast was taken of it. It was then immersed in water at various temperatures, commencing with  $140^{\circ}$  F. and rising to  $212^{\circ}$ . Its contraction was proven by the increasing difficulty experienced in fitting it to its testing cast. At boiling heat its contraction was 2.5 millimeters from heel to heel, and 0.9 millimeter from back to front. When pressed home on cast (which could be done only by warming it) it showed a space of 0.7 millimeter at dome.

The last mentioned plate thus contracted was treated till pliable, and then pressed home on its cast, a firm pressure being maintained at the palatal dome till cooled. *Result:* The above mentioned space at dome disappeared. The heated vulcanite had stretched.

Let us now summarize the facts demonstrated by these experiments: Vulcanite contracts in cooling, even to as much as 2.8 millimeters in three inches; after fully contracting, after repeated vulcanizations, it expands and puffs. Both expansion and contraction is least with weighted rubber and red and black are in this respect nearly alike; contraction is not completed at the first vulcanization, but may be increased by each successive vulcanization up to four or six, and that even when the heat of these later vulcanizations is less than that of the first; this contraction



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may be prevented by forcible means, such as a metal bar of sufficient strength, or an investment possessing sufficient post-vulcanization hardness; even good plaster of paris, if given twenty-four hours to harden, will nearly prevent contraction; plates do not warp in polishing; plates may be reduced in size by immersion in hot water, contraction beginning at 130° F. Vulcanite may be stretched when heated till pliable.

To theorize: Thick plates are probably more subject to contraction than thin ones, because of being better able to overcome the resistance to contraction offered by the investment. Besides, very thick plates have a vertical contraction which is not altogether to be ignored, seeing that it is quite uncontrolled, and that the contraction of a mass of vulcanite one-half inch thick is about 0.17 millimeter at first vulcanization.

The force with which a very thick lower plate contracts probably sets at naught the resistance of any investment. For such the serrated bar would be very beneficial. As the power of an investment to control the contraction of a plate must depend upon the hold it has on said plate, it seems probable that the little pits caused by bubbles, etc., in the investment, and which fill with rubber in closing the flask are to be regarded with friendly eyes.

In conclusion: The contraction of vulcanite in cooling, though theoretically an evil, has undoubtedly been a friend in disguise to the plate-maker, counteracting in a crude way, the expansions of plaster and the uneven compression of models in flask-closing. As plaster of paris expands while crystallizing, then expands still more during the following twenty-four hours, then suffers compression during flask-closing in such a way as to throw the plate's greatest pressure on the palate, and then expands again enormously under the steam of the vulcanizer, this contraction of vulcanite in cooling has come as a blessing, and in the few cases where it has exactly balanced the other evils a successful adhesion has been obtained, this success having resulted perhaps from the mere chance that the case was vulcanized when the investment had enjoyed a night's rest in which to harden, or *vice versa*.







## Distal Movement of Molars and Bicuspid.

By LLOYD S. LOURIE, D.D.S., Chicago, Ill.

*Read before the American Society of Orthodontists, Philadelphia, October, 1902.*

With the establishment of orthodontia as a distinct specialty, there ought to be a noticeable improvement in the the standard of results obtained by those engaged in its practice. The specialists cannot be satisfied with a simple improvement in the positions of the teeth, but must strive for the best occlusion and the best facial expression compatible with the peculiarities and type of the patient.

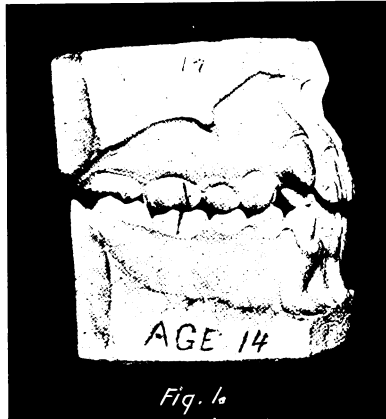
The few suggestions of this paper relate specially to conditions in which the requirements of occlusion and facial symmetry are intimately blended; cases, in which it may seem impossible to obtain the desired occlusion without disfiguring the face by undue prominence of the lips; cases, which generally suggest extraction and the saying that "the teeth are too large for the jaws."

Undoubtedly this may occasionally be true, but too often irregularities are placed in that class through faults in diagnosis. It may be that no allowance is made for the probable development of the face to accommodate such teeth, after they have been regulated, and a further mistake is made in considering the first permanent molars as

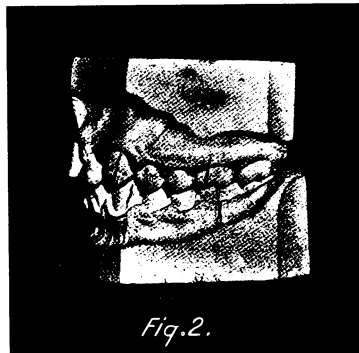
**Malposition of the  
First Molar.**

## ITEMS OF INTEREST

fixed points in the dental arch and that all expansion must be labially and buccally. The importance given the first molar as the most constant in its position may be responsible for this apparent indifference to the fact that it may change its position mesially as well as buccally or lingually.



It is well known that the early loss of deciduous molars or cuspids or the tardy eruption of bicuspid or permanent cuspids will allow the permanent molars to move mesially, and that is just what has taken place in many of these cases. It will be found that the molars and probably the

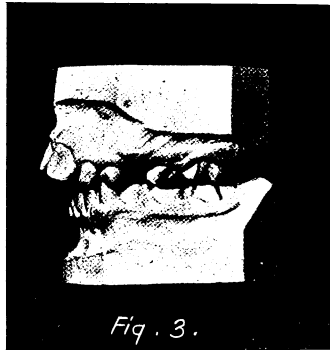


bicuspid are forward of their normal position relative to the face. The upper and lower molars may be in normal relation with each other, mesio-distally, yet both may be forward of normal relation to the face, or such malposition of molars may be associated with any variety of malocclu-

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sion. Figures 1 and 2 illustrate types that are quite common. In the first, both upper and lower molars and bicuspsids have moved forward together, possibly from early loss of temporary cuspids, while, in the second, the change has been limited to the uppers. Figure 3 shows the teeth of a child 8 years of age, whose upper first permanent molar has moved forward, carrying with it the second temporary molar. The protrusion of the upper incisors was caused by thumb sucking and did not affect the other teeth, for the cuspids in the illustration are seen to be in normal occlusion, as are also the teeth in the opposite side of the mouth. It will, doubtless, be allowed that such shifting of molars is a common occurrence, and, granting that it is, how shall it affect treatment?

If all of the teeth are aligned and the position of the molars unchanged distally, the lips must necessarily be made too prominent. On the other hand, anyone who fully appreciates the value of each and all of



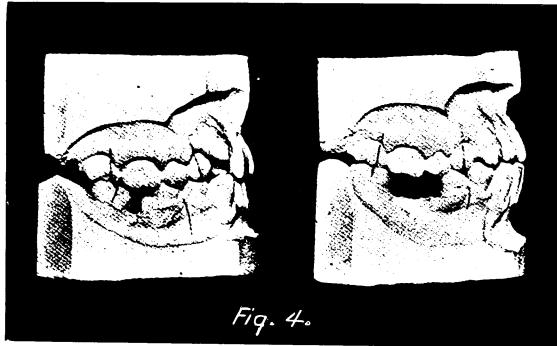
the teeth, will avoid extraction, if it is possible to do so. The general objections to extraction as a corrective procedure are so well known as to require no discussion, but it may not be amiss to suggest special objections in the cases under consideration. Ordinarily, the six anterior teeth are the objects of concern in attempts at improving the contour of the lips and extraction usually makes more room than is actually needed to allow them to be placed as desired. To close this extra space, the anterior teeth are moved lingually, the median line disturbed, or the molar moved farther forward. Again, extraction in one arch may necessitate all of the tooth movement taking place in that arch, when a study of the face indicates that it should be partly in each arch. Best results can be obtained only when the teeth are placed in normal relation to the face, as well as to one another.

## ITEMS OF INTEREST

### **Distal Movement of Molars.**

The rational solution of the problem is to move the molars distally, placing them in normal position, if possible, and, as this is done so seldom, one is led to believe that it is considered too difficult to be practicable. However, it is not only possible, but frequently advisable and can be brought about along with other movements, if care is exercised in selecting anchorage and applying force. The main point in treatment is to see that force is applied directly to the molars. It would seem unnecessary to mention this, but attempts have been made to move the teeth distally by applying force at the center of the arch over the incisors, which necessitates overcoming the resistance of all the teeth at once, instead of a few at a time, as when molars are moved first.

For convenience in description, treatment may be divided into two classes according to the anchorage required. In the first, teeth in the

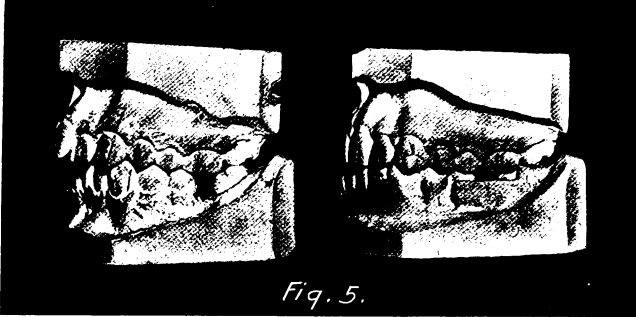


same arch are used for anchorage, while in the second those in the opposing arch are used. Occipital anchorage may be used to reinforce either of these.

Figure 4 illustrates the first method in a case **Case I from Practice.** requiring most of the distal movement for the upper molars and bicuspid. Treatment was commenced in January, 1901, and the movement in the upper arch occupied two months, the patient being a young lady 18 years of age. An expansion arch was used to bring about labial movement of incisors and distal movement of molars at the same time. Ordinarily, the orthodontist is careful to favor his molar anchorage and be certain of moving the incisors by attempting to move only one or two at a time, but to move molars, all of the anterior teeth are attached at once to create as much resistance as possible. In this case, the first and second molars were moved at the same time and then the bicuspid, but it is prefer-

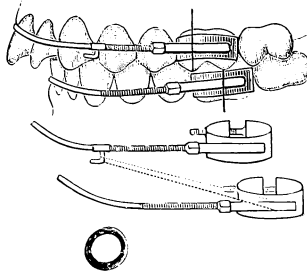
# ORTHODONTIA

able to move the second molars first, in difficult cases. The second view (Fig. 4) shows the positions of the teeth immediately after removal of moving appliances, and, though occlusion is not finally adjusted, the change in the molars and bicuspidis is readily seen. After provision has been made for the retention of the improved arrangement of cuspidis



and incisors, their distal tendency plus lip pressure affords the necessary retaining influence for molars and bicuspidis.

Figure 5 illustrates the second method in a case **Case II from Practice.** requiring distal movement of the left upper molars and bicuspidis, using the opposing arch for anchorage. Treatment was begun in March, 1902, and the movement in the upper arch occupied about three months, the patient being a young lady



14 years of age. An expansion arch was used on the upper teeth for the attachment of the "Baker anchorage" (Fig. 6), which moved the molars distally, at the same time reinforcing the anchorage used in regulating the lowers. In the original use of the "Baker anchorage" an Angle "B" arch was used, making anchorage of practically all of the upper teeth



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for the purpose of moving the lowers forward, but an expansion arch is preferable, if the upper teeth are to be moved distally. The nuts upon this arch may be so adjusted as to keep the force applied directly to the molars, as it should be. The second view of Fig. 5 is simply to show the change in position of the upper teeth. The occlusion is not quite what it should be, as the lowers were not completed when the models were made. If the lower molars were to be moved distally, instead of the uppers, the same treatment would apply, the anchorage being reversed.

The retention for such cases is that ordinarily used after jumping the bite. In this particular case, retention was provided by an inclined plane in the form of an extra cusp on the lingual side of the upper cuspid (Fig. 7). This, occluding with the lower cuspid, prevents the uppers from moving mesially.

### Discussion.

In calling for discussion of the paper, the Chairman said:

The question of whether the upper teeth actually move forward or



not is one that has been often debated. This is material for discussion for us.

Less than a year ago I visited Dr. Lourie in his office in Chicago and had the pleasure of comparing notes on different things that can be used with that wonderful system of Angle regulating and the forces that can be applied through that arch was demonstrated to me and led me to make applications of the paper that has been read this evening, although it never appeared to me in the way it has today.

In my own practice I had a case of marked retrusion of the lower jaw and the condition of the molar prevented the proper elevation of the bicuspid. By means of the arch in front of the anterior teeth I moved

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the molars back as the doctor has suggested and thereby obtained plenty of room for the elevation and eruption of the bicuspid which was so crowded. I simply state this to verify the idea presented. It is just another example of the power properly applied through this arch as being able to reach any and all cases in orthodontia.

In answer to a question by some one, Dr. Lourie stated that the appliance had been on about three weeks.

I wish to commend Dr. Lourie's paper because  
**Dr. Pullen.** of the fact that it has added some very valuable points and methods in the use of the expansion arch. It seems to me that the possibilities of this arch are almost limitless.

Speaking of the mesial or forward movement of the molars and bicuspids, I have noticed that lately in a number of cases. I have in my pocket a couple of photographs of a case similar to the one Dr. Lourie showed you on the screen. (Photographs produced and passed around for examination.)

I want to thank him for the presentation of the  
**Dr. Weeks.** matter. It is the first time I have heard it spoken of in a society, and I think it is something the value of which is almost inestimable. I want to thank him for the idea.

Dr. Lourie in closing said he had nothing further to say especially, except that it had been a great gratification to him that there had not been as much criticism as he had expected, and thanked the society for the approval they expressed apparently by the lack of criticism.

The meeting then adjourned.

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## Fixed and Removable Appliances, Alone and in Combination.

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By HERBERT A. PULLEN, D.D.S., Buffalo, N. Y.

*Read before the American Society of Orthodontists, Philadelphia, October, 1902.*

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In presenting before this society a paper differing in its ideas somewhat from that of the advocates of either the fixed or removable system of appliances, I wish to say at the outset that I am not trying to advance any new theories or make unfavorable comparisons, but to show that it is possible to use both systems in practice, even in combination, in the same case to good effect and to better advantage than if one were limited to the use of but one of the two systems.

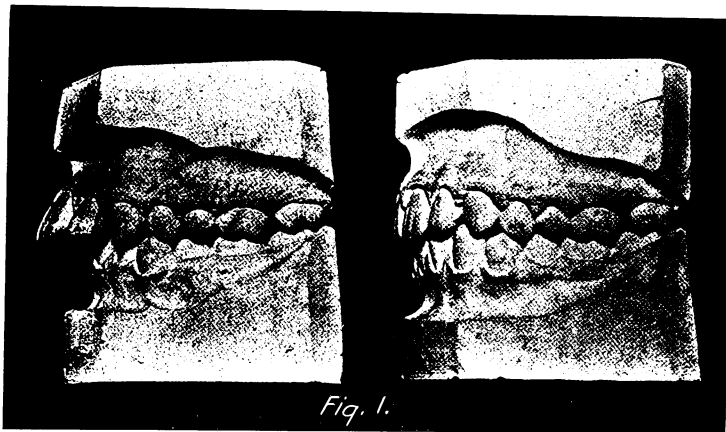


## ITEMS OF INTEREST

Adaptability is a quality which I believe we should cultivate, but it is impossible to appreciate the virtue in it unless we are broad enough to be eclectic.

**One System  
Undesirable.**

The originators of systems deserve our most profound respect and esteem for the benefits we have received as the result of their many years of untiring labor in behalf of the science of orthodontia, and it is only natural that they should believe that the system which has been their own creation should seem the best to use in all cases. But to the student of both systems, the question of choice will always be paramount, if his knowledge and experience have proven to him that of two methods of managing a case, one is more advisable at one time than the



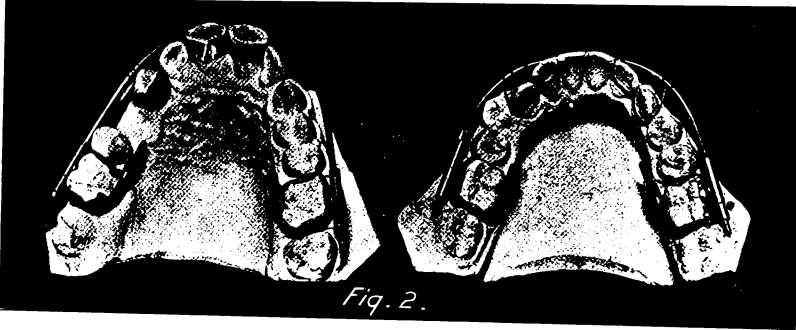
other, whether by reason of freedom from pain, inconspicuousness, fixedness of appliance, cleanliness, shortening of the time of operation, or performing the same with the greatest amount of comfort to both patient and operator as in requiring less attention and consequent less frequent appointments, etc.

The first case which I shall consider and which **Case I from Practice.** is represented in Figs. 1, 2 and 3, is one of unilateral distal occlusion; the treatment indicated being the harmonizing of the occlusion on the right side by extraction of an upper bicuspid and retrusion of the upper incisors and cuspids; or a unilateral jumping of the bite on the same side, with correction of the pointed shape of the arch, and restoration of the faulty facial lines. The former method was chosen, and the appliances used are shown on the models (Fig. 2),

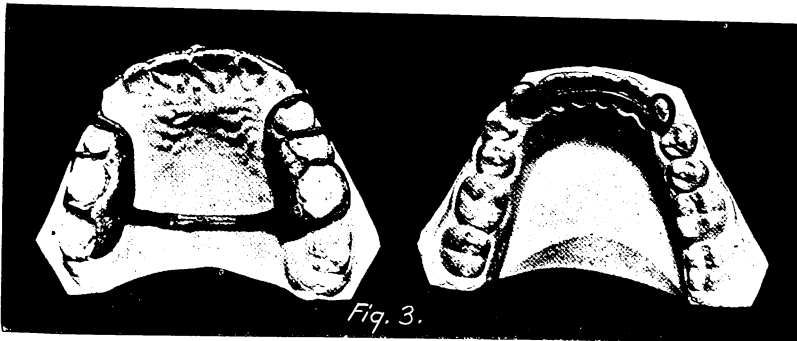


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being the well known Angle appliances; the contraction arch and traction screw in connection with the headgear being used on the upper arch, and the expansion arch alone on the lower. The models before and after Fig. 1 show the result of the treatment. The novel feature of the case is represented by the retention of the upper teeth after treatment was



concluded and consists of a removable appliance constructed after the Jackson method, which not only retains the teeth in position, but exerts a gentle retractive force sufficient to guard against any possible return of the teeth to their former malposition. The retention of the two arches is illustrated in Fig. 3. Although the removable appliance on the upper

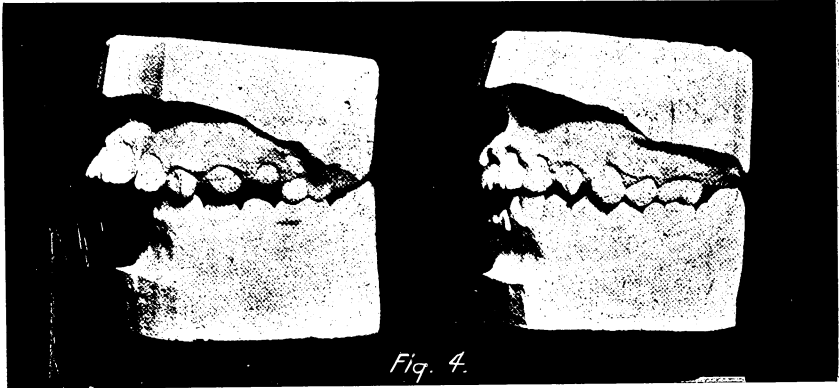


arch is here used simply as a retainer, it might have been used to perform the operation of reduction of the anterior protrusion but would have taken much longer time than if the headgear and fixed appliances were used. The retention of the lower arch consists of the cemented bands on cuspids, joined by the soldered wire.

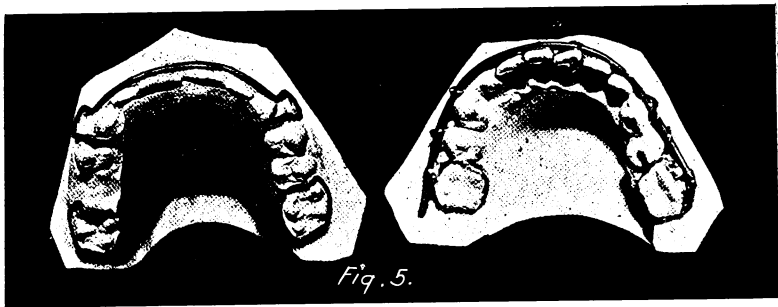
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### Case II.

The next case I shall describe, Figs. 4 and 5, is illustrative of a case for which the fixed system furnishes no specified appliance for the reduction of the superior protrusion without the use of the headgear unless rubber bands or coiled springs are used with an arch sliding through tubes on

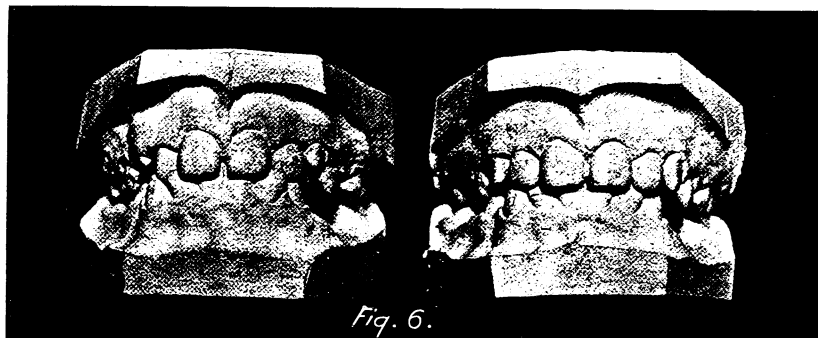


molar bands, while with the removable appliance, as constructed in this case, the use of the headgear is entirely unnecessary, a point of very great importance. With the use of the Baker anchorage the protrusion could have been reduced, but would have required wire arches on both upper and lower teeth, while the operation as performed in this case was limited to the use of but a single appliance.



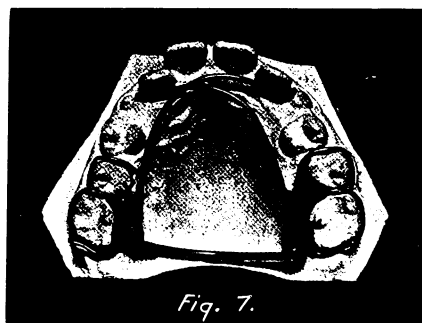
This appliance deserves honorable mention among the list of those that should be and are in common use today. Its construction is simple, being a combination of the roof-plate and the Jackson spring clasp attachments. Just at this point I wish to observe that the plate as used in this combination forms one of the most cleanly appliances that we have, which

is contrary to the opinions of many who probably have not given it a trial. Another very wonderful thing that this appliance will do is to depress the incisors in their sockets after the reduction of the protrusion



by reason of the pressure on the double inclined planes buccally and lingually, by the spring wire plate.

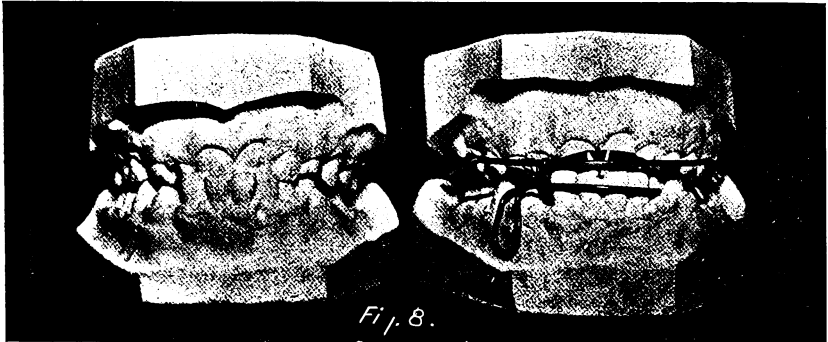
The diagnosis of this case, it being of Class I. (Angle), indicated reduction of protrusion alone in upper, and depression of incisors and



elongation and buccal movement of bicuspid in the lower. The removable appliance shown on cast was used on upper, and the Case stationary appliance for straightening the arch was used on the lower jaw. See Fig. 5. Both appliances were eminently satisfactory in the positions

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used. The removable appliance on the upper also makes a very efficient retainer. There are a great many cases of a similar nature in which it is advisable to use such an appliance in preference to the headgear apparatus, where the age is favorable and where the protrusion is not so extensive as to require a long operation. It possesses the advantages of



inconspicuousness, efficiency, cleanliness and comfort. The models, before and after, are shown in Fig. 4.

The next set of models, Fig. 6, illustrate a case of the first class, in which a removable appliance was used to move the laterals into labial occlusion. This appliance, Fig. 7, is perhaps of no more advantage than the expansion

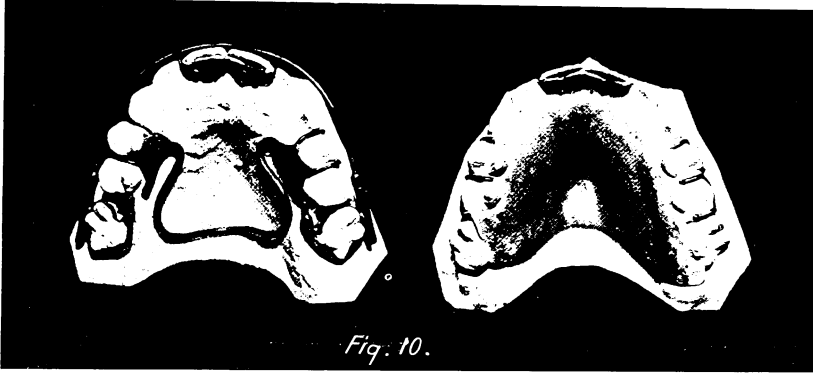


arch would be in the same case, nor as much, if we consider the time necessary to make the appliance; but if the appliance has been made by the assistant in the laboratory, time lost is not so much a factor in the case, while the inconspicuousness of the removable apparatus gives it a decided advantage over an outside wire arch of wire.

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## Case TU.

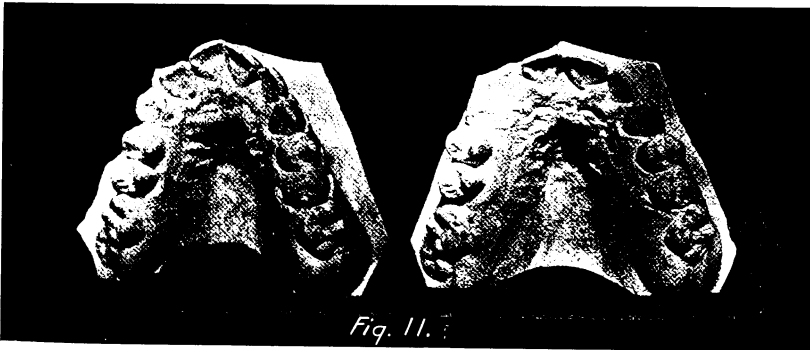
The models illustrated in Figs. 8 and 9 show a still different combination of appliances, an expansion arch, on the upper, and a removable appliance on the lower arch, the case belonging to Class I. As the case had not been completed at the present writing, the results of the treatment



cannot be shown, but the appliances have proven efficient and satisfactory thus far.

## Case U.

The last set of models, Figs. 10 and 11, illustrate a case (18 years) in which it was necessary to use a re-enforcing arch on the lingual side in connection



with an expansion arch on the buccal side of the upper teeth in order to hasten the operation so that it would be completed in the short time allotted for it. The inner arch is a removable appliance with spring clasp attachments (after Jackson) and it more than equalled my expectations



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in the results it accomplished. It is seen *in situ* on the upper cast. The retention of this arch is a small plate touching the molars and bicuspid and provided with spring clasp attachments. The two central incisors are retained by the means of platinum gold bands soldered together and cemented in position. Fig. 11 shows the upper arch before and after treatment.

Without considering the advantages or disadvantages of either the fixed or removable appliances in general, I would state that the combinations used on the models shown were eminently satisfactory and that many advantages may be derived from the combined use of the fixed and removable appliances, as shown in the cases presented, and the knowledge of more than one system is an added resource which ought to be of especial advantage to the orthodontia specialist, and commendable to him on that account.

### Discussion.

I have listened to the reading of this paper with **Dr. Milton C. Watson.** considerable interest, and if it had been presented to us three years ago I would have considered it a valuable one, and the results highly satisfactory. At this time, however, I cannot endorse his treatment of the case representing a subdivision of Class II., for, with the means we have at hand now for the management of this class of cases, I fail to see any excuse for the extraction of a bicuspid. There was a time when we knew no way to manage this type of case without extracting, but as a means of correcting *occlusion*, it is obsolete treatment. The only cause for extracting, especially in younger patients, being where it is a positive facial requirement, and Dr. Pullen did not tell us that this was his reason for doing it in this case. That the occlusion would have been more nearly perfect and the apparent retrusion or depression of the anterior part of the dental arches avoided, by shifting the distal occlusion to normal, and thus retaining the full complement of teeth, is to my mind perfectly clear. Then, too, unless the lips of this patient are unusually thick there must be the same degree of depression in them that is so apparent in the dental arches.

Aside from the better results which would have been secured by the plan of treatment just referred to, there is another and a most important consideration; the necessary appliances would have been much more comfortable, and less conspicuous, in that both the traction screw and the headgear could have been dispensed with.

The plan of treatment which I believe would have served the purpose better in this case is briefly this. The shifting from distal to normal occlusion by the use of the well known expansion arch and clamp bands

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above and below, together with the necessary wire ligatures and the Baker reciprocal anchorage, which is the pitting of the teeth in one jaw against those of the other by slipping an elastic band over the distal end of the pipe on the D band below and over a little hook on the arch above, soldered about opposite the cuspid tooth.

Just a word in regard to the combinations of appliances shown. They are certainly an evidence of mechanical ability in so far as their construction is concerned, but our little patients' comfort, I believe, is best served by the avoidance of these magnificently complex combinations of appliances, especially those on the lingual side of the teeth and still more especially those across the roof of the mouth, for they are a source of constant discomfort as they impede every movement of the tongue both in speech and in swallowing. When we stop to consider that under normal conditions the tongue is nearly, if not quite, in contact with the roof of the mouth we will hesitate to adopt the use of appliances which will be more or less of a restriction to the every movement of this very restless organ.

It has been too often demonstrated to need enlarging upon here, that even the most complicated cases of malocclusion can be managed successfully by simple, delicate appliances which are a source of very little inconvenience to the patient, and which allow a man to spend his energies studying and investigating the really difficult problems of orthodontia, instead of devoting his time to the designing of new and untried appliances, which at best, must be far from perfect, for a perfected appliance can be produced only after repeated trials have demonstrated the weak points of those that preceded it.

It is an indisputable fact that fixation of teeth  
**Dr. M. Dewey.** whose position has been changed is an absolute necessity for their speedy and permanent maintenance in their corrected position. Immovable appliances being the only kind offering such advantages, I deem it imperative that removable retainers be discarded.

In regard to the author's claim that under certain conditions fixed retainers invite dental caries, I wish to state that properly fitted and cemented retainers which permit cleansing of the parts involved do not predispose to decay.

And lastly I need but remind you of the innate desire of our patients to forget replacing any and all removable appliances.

My views coincide with Dr. Dewey's in respect  
**Dr. Casto.** to the removable appliances regarding the effect they might have on the teeth or the periodontal membrane. I believe that the inflammation which is bound to be set up by means of a



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removable appliance might result in complications such as death of the pulp, and inflammation which would interfere to a certain extent with the resorption of the process that takes place. I think also that the removable retaining appliances have the same bad features. Outside of their being perhaps a little more cleanly, I cannot see any advantage whatever in having a removable retaining appliance. However, fixed appliances as constructed today are so cleanly that that is really no objection whatever. I do not see the necessity of using a combination appliance when we know that the results can be obtained by simpler means.

I am very glad the Doctor has presented his  
**Dr. U. E. Barnes.** subject, because it has long been my desire to see what Jackson cribs were and how they operate.

Personally I cannot see why there need be any great departure from the arch, since we have in it the ideal shape of the dental arch when the irregularities are corrected. When we make attachments across the mouth with these appliances, we are limited to a few teeth. However, the writer is to be commended for not tying to one sort of appliance and with these different methods of operating we will get more real progress than we would if all were working alike. I must say that I do not like springs attached to movable appliances. They must either start irritation and inflammation, or the case must be attended to at frequent intervals; and with what little experience I have had, I find that in removing to clean, something happens to prevent the patient putting them back in place and we have trouble right away. Of course inconspicuousness is a good feature and I can see how now and then such an appliance would become commendable and useful. In noticing results obtained in the models presented, it appears to me that the doctor has not gone far enough. The incisors do not seem long enough to come down to a proper occlusion with the growth of the alveolus. If they will, I shall be only too glad to know it. In some of the cases the molars seem too long and apparently will not change much more, consequently I should be afraid of subsequent irritation, leading perhaps in later life to pyorrhoea alveolaris.

I think the essayist is to be congratulated for  
**Dr. Flint.** the care he has taken in the preparation of the subject. I believe if we have difficulty in the holding up of the retaining plate after the arch has been widened, that crib around the bicuspid might be a good thing.

As far as the removable appliances are concerned, I have not had much experience, but what few wrenches I have loaned my patients, I find when they get in front of the mirror they get them pretty well twisted and they will undo in a moment more than you can make up in two or



three days. I think the less the patient does for us and the more we do ourselves, the better it is for both.

I am tempted to tell a little story which a gentleman from Kansas City has often repeated in my hearing, of a man in a certain town who always had a most charitable feeling for everybody, and which fact was well known. One time there was a man died in the town, for whom no one had a good word. Some of the people put up a job on the old man to see what he would say of the dead man. They started in to tell all the bad things they could of the deceased, saying everything they could that was derogatory to his name, and then finally turned to this man and said, "Well, what do you think of him?" "Well," he said, "he had mighty pretty teeth!" So we might say of Dr. Pullen, he has mighty pretty teeth in his models. I was inclined to think at first he had carved them out of a solid chunk of ivory, but I saw some slight imperfections in them so I know they must be real models of real teeth. I wish to congratulate the Doctor on his models.

I feel like jumping on Dr. Pullen for his treatment in some of these cases, but then I have made some of these mistakes myself, and I believe he will know better after awhile; he will be convinced of it by his own troubles.

I once was a firm believer in putting appliances on the inside of the mouth. I would not put anything in the patient's mouth that was at all conspicuous, but my patients convinced me it was more comfortable to have the appliances on the outside of the dental arch, and Dr. Pullen's patients will convince him of this in time.

I, like Dr. Brady, wish to congratulate Dr. Pullen on his fine models. It is not every day we see such fine ones, I assure you. I have received a number of barrels full from dentists in my time, and I do not think in all that number I have ever had in my hands—at least not more than three or four—that would compare with these beautiful models that Dr. Pullen has shown us this evening.

In regard to treatment I shall have to differ with him radically. In my paper that I shall bring before you tomorrow afternoon I shall point out these differences and shall reserve what I would say until that time. I will only say here that if we could do better work with half a dozen appliances, or with half a hundred appliances, we ought to have them. It should be our object to treat cases as easily and quickly as possible, of course consistent with physiological and ideal results, and if we can do that better with a dozen different systems, we ought to have them. But if we can really do better work with only a few appliances, or with



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even only one appliance, would this not be far better? Do you not see how much greater skill could be developed in using but one than in using a hundred—or over six hundred, as one writer on this subject boasts that he has produced? Think on this point hard. And if I cannot demonstrate beyond the shadow of a doubt to the most skeptical man here, if he will be honest, that numbers of appliances are unnecessary and have hindered and do greatly hinder the real progress of orthodontia, I will frankly own to you that I am mistaken.

It is well known to most of you that the number of my own appliances was always few and very simple, and many have doubted whether they have been sufficient in numbers to meet all requirements in tooth movement, but I have found that even these few were too many and no longer do I make use of nearly so many in practice. In fact the more I simplify the appliances and treatment the quicker and easier am I able to treat cases, and not only do I obtain better results, but such results as were not believed to be even remotely possible a few years ago. Many of these I shall show you tomorrow and what may surprise you more than anything else is that they were all brought about with but practically one appliance.

An appliance that I once thought to be very valuable—and so it was in its time—was the jackscrew—and I believe that I have invented the best one known to orthodontia, the simplest, the neatest, the most efficient; one that has been pirated and imitated in all conceivable ways, and one that has the greatest sale, I am told, of any appliance, yet in my own practice I have no longer any use for it; I have not used one for nearly two years. I believe that in practice it should now be obsolete, and that it should live only in history.

Of course I have no expectation that complicated regulating appliances will be abandoned by dentists. In fact the greater the number of pieces and the more complications, the better they seem to like them, and the more awe and admiration they seem to inspire. It is the very age and craze of absurd complications and numbers of regulating appliances, and the reason for this is, I suppose, because orthodontia is such a side issue with dentists and their main interests that they cannot be induced to study it with even average thoroughness, to say nothing of what its study really requires. And so, I suppose, it will continue to be until dentists can be induced to study occlusion and its requirements, of which they know almost nothing at present. Then they will realize how extremely ridiculous and absurd are the thousands of little appliances that were supposed to be so ingenious—appliances that were made to operate with a view of straightening the crooked teeth, to operate on symptoms, instead of *to correct malocclusion* in accordance with the demands

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of the dental apparatus as a whole and with the facial lines. There is no branch of medical or dental science that needs such complete revolutionizing in the minds of its followers as orthodontia.

But as results will speak more eloquently than I can, I will wait until my paper of tomorrow to speak further on this subject. I think if you will read between the lines you will see that it will prove what I have said.

If one were to judge by the amount of criticism  
**Dr. Pullen.** that these appliances and combinations had evoked, one could but conclude that it is the opinion of the majority of those present that removable appliances used alone or in combination with fixed appliances are of little value. Were it not that they have proven valuable to me in so many cases, I should feel somewhat discouraged about convincing any one of the fact. But I shall hope that there was enough in the ideas expressed in the paper to stimulate some of those present to at least try some of these combinations when they feel the need or the inclination, trusting that they may be as much benefited by them as I have been.

In the first case which I presented, Dr. Watson said that he would have used the Baker anchorage and jumped the bite unilaterally. At the time this case was started, about two years ago, we were a little uncertain about this treatment, and I believed that the best results to the facial lines were accomplished by the extraction of the bicuspid and re-trusion of the superior incisors. At present I should have no hesitancy in using the other method of treatment in the case, as I am doing it in similar cases presenting, with marked success.

I must differ with the gentleman who stated that removable appliances are not efficient retainers. Even Dr. Angle, who uses fewer removable appliances than anyone else I know, exhibits a removable retaining plate in his latest book.

Also, the removable appliance is not uncleanly as is popularly supposed; the very fact of its being removable marks it as the most cleanly appliance that we have. If properly constructed, the removable appliance will not interfere with occlusion unless we wish it to. The removable roof plate retainer exhibited on the last case, is not so easily displaced as the roof plate without the spring clasp attachment, and is therefore more advantageous.

In the treatment of this same case, Dr. Lourie questioned the necessity of using an inner re-enforcing arch, as judging from the model, he should say that the patient was not over twelve years of age, and that the expansion arch alone ought to have been sufficient. The fact is that the patient was eighteen years of age, the molars and bicuspids were in



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lingual occlusion, and as the time for the operation was limited to a few weeks, the expansion arch alone was utterly inadequate.

As to the removable appliances causing pyorrhea, I have yet to find out from the experience of others and my own that they do so, and I might give the same answer to Dr. Casto's query whether or not the periodental membranè was affected by these appliances.

Some of these cases are incomplete, as unfortunately it was impossible to finish all the cases I wished to present at this time; hence I can show the results to date only in one or two of the cases.

From the remarks of Dr. Brady and a few others I infer that they have misunderstood my paper to the extent that they believed that I was working entirely with the removable appliances, or at least gave them the preference over the fixed appliances in all cases. That is not the impression I intended to convey, as I have only spoken in this paper of special cases in which I deemed it advisable to use them alone or in combination. Experience is a valuable teacher, and if she has taught Dr. Brady many years ago that removable appliances are obsolete and never to be used, she has taught me the opposite lesson, that there is a place for removable appliances and retainers where the fixed appliances are not so advantageous.

I wish to thank the gentlemen who recognized the great amount of work necessary to prepare and mount the models and appliances for this exhibit and expressed themselves in such a kindly manner. I thank you for the attention you have shown my paper as evidenced by the discussion.





## Advertising Dentists.

By EMORY A. BRYANT, D.D.S., Washington, D. C.

*(Read before the District of Columbia Dental Society, Jan. 20, 1902.)*

At a previous meeting of this society, at the conclusion of some remarks by the author, I was requested, by the unanimous vote of the members present, to present you a paper bearing upon the subject of the advertising dentist and his relation to professional life. It is with some regret as well as pleasure that I have taken you at your word, and shall now endeavor to entertain you with some facts which I hope will have the desired effect of producing a better understanding of the relation of man to man in connection with dental society matters.

I am not here to judge others—that must be your privilege—but I am here to lay facts before you that you may judge.

It has always been a mystery to me why men who have transgressed every decency of professional life in their own actions should be so harsh when called upon to judge others. I can conceive of a man who has ever led a moral life himself being astonished at the transgressions of others who have fallen by the wayside, but for one who has groveled in the filth to the bottom of the pit to rise up in virtuous wrath to hound those who may have followed in his footsteps is a feature of human nature I have been unable to comprehend.

We of the dental profession are not alone in respect to social reformers; politics and the pulpit have theirs as well.

It is a peculiar thing, but a notorious fact, that those who proclaim the highest standards of virtue for others are often those by whom virtue has been most outraged.





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How often do we hear men who have transgressed all the ethics of the profession in their early life, and so long as it served their purpose, get up and extol the beauties of professional ethics laying down rules and regulations for the guidance of those who are just entering upon their life's work, which, had they followed themselves at the same period of their own existence, would have driven them out of the profession or into the poorhouse.

They say that experience is the best teacher; and it may be their experience was such that the scales fell from their eyes in time to save their souls, and they feel called upon to offer themselves in meek humiliation that others may be saved.

Gentlemen, if these men would only keep the humiliation for themselves and not try to foist it upon others—judge others as they have themselves begged others to judge them—I would be content to let their consciences be their accusers and God their Redeemer.

The Lord said: "He that is without sin, let him cast the first stone." These men have evidently read it, "He that hath sinned, throw all the mud possible."

You have sat and listened time and again to men in this society regale you with stories of the shortcomings of those poor deluded souls who, in the past, have endeavored to call enough of the attention of the public to their abilities as dentists to serve their wants and enable them to obtain food, shelter and raiment for urgent needs, who at last awoke to their professional duties and desired to come within the fold of this society's banner, and advise against their admittance.

Their memory fails to go back to the point in their lives when they were asking alms and begging for forgiveness, and instead of paving the way for the applicant's redemption, they close the doors and refuse the shelter that saved themselves.

Standing here tonight before God and my fellowmen, I have no interest in holding up to scorn the names of individual members in revenge for past injury to myself or to my friends, nor have I a wish to hurl them from any pinnacle of fame to which they have attained. I shall confine myself to such remarks as I may think the occasion requires.

When I first came to the city of Washington,  
**Personal Experience.** I was requested again and again to give lectures and clinics before the members of this society, and I acceded to as many as my time and the variety of subjects upon which I felt the dental profession might be interested allowed me.

The new departure I had made in my methods of practice, limiting my work to prosthetic dentistry and seeking the support of the profession in a personal practice, not to run a dental laboratory for the purpose

of doing the mechanical work for the general practitioner, made me take into consideration certain characteristics as well as prejudices upon the subject of establishing one's identity in a new locality by members of the same profession.

My experience of several years' standing was that dentists as a rule, and dental societies in particular, were adverse to any proceeding which had the appearance of making public claims of superiority of work, methods or ability; and my knowledge of human nature warned me that I need expect aid but from a very limited number of my brother dentists so far as advising patients to go to me for professional services, unless I sacrificed my manhood, honor and conscience and stooped to offer a premium for such courtesies; and as that would mean either robbing myself, or worse yet, robbing the patient by adding to the bill to pay the premium, I have not had the additional business referred to me by some of my professional brothers, which otherwise might have been the case.

Coming among you as I did, a perfect stranger to the public as well as the dentists of your city, and confining my practice to the specialty of crown and bridgework and work directly incidental and connected with the case in hand, and not being blessed with a bank account, it behooved me to look well before I leaped. I had open to me three ways to obtain a practice:

First—To clinic and lecture before the dental society, thereby making my work and myself known to the dentists and asking their support and, I might add, getting it or failing to obtain a living.

Second—To open an office, put out a sign and sit down and wait till some one wandering round shopping dropped in.

Third—To announce to the public what I had and what I could do.

I chose the first as a beginning and labored long and late in that direction, the profession accepting all I could give of my methods and my inventions with not so much as a "thank you," with but few exceptions, for my efforts.

Common sense forbade the second. Patients are not shopping for bridgework as a rule; and as I did not do general dentistry, I could not see how the public was to know that I did anything else, and not being able to support myself and family on air, I did not attempt it.

The third and last was the only sensible thing left; but as I had ambitions and hopes of making a name and fame in my profession I had to use care that I might not offend by such style of advertisement as would not meet approval; still such as would draw the attention of such persons as might be in need of services I proposed to give.

With these facts well in mind, I proceeded to visit the leaders of the



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profession in this city personally, explaining what I proposed to do and my reasons therefor, and I asked them for their personal support and the use of their names as reference. I told them of my hopes and ambitions and that I was desirous of doing nothing which would class me with what is commonly known as the "advertising quack and Cheap John," nor be detrimental to my professional standing. Every one of them acknowledged that I had a right to make the announcement desired, and they gave me their personal permission to use their names as reference in the announcement. With this explanation and with no apologies whatever, I read you the announcements.

My announcements were confined to postal cards directed personally to some 1,500 of the leading people of the District of Columbia and were as follows:

Respectfully submitted,  
Emory A. Bryant, D.D.S.,  
Dental Specialist.

Practice Limited to Crown and Bridgework.  
(Teeth Without Plates.)

References by permission: Dr. W. S. Harban, Dr. Thos. O. Hills, Dr. Geo. B. Welch, Dr. D. McFarlan, Dr. M. F. Finley, Dr. H. B. Noble, Dr. H. M. Schooley, Dr. L. C. F. Hugo, Dr. A. J. Brown, Senator G. G. Vest, Senator Wm. Stewart, Hon. J. G. Cannon, Hon. E. F. Loud, Hon. C. A. Chickering, Hon. G. A. Wise, Hon. John G. Carlisle, Hon. Wm. R. Morrison and others of like prominence.

When these cards were sent out, I was in an office with one of the members of this society, and I was in consultation with him upon every announcement made; and he will doubtless tell you, if called upon, that in my practice I confined myself strictly to what my announcement claimed, and that my prices were *higher* than those of any dentist in this city, and I can easily prove that since that time my prices have still continued to be higher than the fees of any dentist now in practice in this city. I have never claimed superior *skill* as a dentist by announcement or word of mouth, but I have claimed superiority of *methods* and *inventions*, and I still claim them and will continue till such time as some one invents something superior to take their place. Thus far that has not been done.

In my clinics, lectures, papers for publication and to friends and those young men who have asked my assistance in time of need, I have freely and without reward given out for the use of the dental profession all my methods and inventions, thus allowing competition without restriction. My whole life has been spent in trying to elevate my profession, not drag it down; to raise the standard of fees that all may obtain a



respectable livelihood from its practice; driving the wolf from the door, not inviting him in; showing the road to success, and not to the poor-house; giving a helping hand to the struggling beginner upon the doorstep, that his attempts to climb the ladder of fame may not be strangled on the sill; helping to open the door and not trying to shut it in his face.

That is one kind of "an advertising dentist," and now we will take up the other.

**Another Style  
of Advertising.**

On the 25th day of August, 1880, a member of this society contracted with the *Alexandria Gazette* for the publication of his advertisement for six months, which advertisement gave his name, business and address.

ness and address.

April 4, 1881, he again contracted with the same paper for three months' advertisement, which advertisement reads as follows:

A CARD.—It should be generally known that persons so unfortunate as to lose one or more of their teeth need not wait weeks and months for artificial substitutes and endure inconvenience, disagreeable changes in voice, facial expression, etc.; but may have artificial teeth made before and inserted immediately after extraction of their natural teeth. By this mode a better adaptation, a more pleasant expression and a nearer approach towards preserving the natural harmony of the features are secured and very much of the pain and difficulty experienced in learning to use teeth are also avoided. I have practiced this mode successfully for seven years and have introduced it here. Would be glad to refer any one interested to patients who know of it from experience. In treating the natural teeth my object is to preserve every one that time, patience and modern methods of treatment can save. The use of arsenic in destroying exposed nerves is condemned by the more enlightened of the dental profession on account of its turning teeth dark, inducing abscess and finally the loss of the teeth. The nerve pulps, which is the source of life to the tooth, should always be treated when exposed with a view to its restoration to health. I use no cheap alloys for filling. My fees are much less than are usually charged for the same class of work. Gold filling from \$1.50 up. Other work at proportionally low rate.

(Followed by name and address.)

This was continued until July 10, 1881, when the address was changed. You will doubtless notice there are no indorsements by his professional brothers. In this advertisement, published in the public press for a period of six months, you have an opportunity to observe another





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mode of calling the public's attention for the purpose of obtaining a practice. It is what one might term a diplomatic and, I might say, enticing notice. Its wording shows a master mind for plausibility. It reminds me of one of these masterpieces generally found accompanying a patent medicine bottle with a description of all the symptoms of diseases known to the medical world which its contents are guaranteed to cure if taken according to directions.

The termination spoils the first effect of its reading, and reminds me of the king who "marched his soldiers up the hill, and then he marched them down again." He secures the attention of the public, leads them up to the top with his sophistical utterances and then dumps them down onto the quack's resort, "I use no cheap alloys for filling. My fees are much less than are usually charged for the same class of work. Gold filling from \$1.50 up. Other work at a proportionally low rate." Now we have reached the bottom of the hill. We are informed that he has superior knowledge, uses the best of material and doubtless in a desire to be charitable to the public, his charges are to be inferior to that of his competitors; lowering the fees are his ideas of raising the standard of the profession; competition in price is a substitute for competition in services; all energies centered on the down grade with only a hope of obtaining by stealth what he had failed to do by truth and honesty.

These are the kind of advertising dentists that are the most dangerous to the profession's welfare, for with their sophistry, suave manner and evident education, it is difficult for the average man as well as the public to see through their veil of deceit.

Such a man may reform—he may even be found in the ranks of the profession later in life trying to smooth his conscience by meek humiliation and a professed penance—but underneath the surface there will generally be found that same insinuating, plausible and deceiving trait of character that cannot be eradicated from a system once steeped in duplicity and deceit; and should he be found at some future time in respectable company advocating what appears to be of benefit to his profession, look well to the end and you will generally find if his plans do not "Gang alee" his aim will land two birds for himself to one for the profession.

"Though poor, luxurious; though submissive, vain.  
Though grave, yet trifling; zealous, yet untrue;  
And in a penance planning sins anew."

We will now venture into still another field, and we find the following:

**Third Style  
of Advertising.**

"SHEFFIELD TOOTH CROWNS,  
Artificial Teeth Without Plates.  
Extraction avoided."

This double-ledged head line is reinforced by large wood cuts of bridges, crowns, etc., and then follows in part

"Twenty-five thousand roots have been crowned and saved which would have been extracted by the old methods.

Besides this, our specialty, we perform with care and skill every operation known to the art of dentistry.

. . . We insert every style of artificial teeth in the most perfect manner possible and at the lowest prices.

General dentistry at moderate prices."

This is an advertisement which can be said to be boastful as well as misleading, the wording showing some of the diplomacy of the last one read, but the "good-for-all-diseases" method is one that is easily seen through by the public as a rule, thus its affect is not so bad. Then, too, if the advertisement should succeed in getting them to the door, the appearance of the surroundings do not generally prove the claims made. One man in a 2 x 4 room is hard to digest in comparing the claims and expectations with the reality. "Twenty-five thousand roots have been crowned" does well as a measure of falsehood and deceit, but the claims of "We perform every operation known to the art of dentistry" is doing still better when it is taken into consideration that the gentleman was just then engaged in his last year at college and had had a very limited experience previous to entering the same. The ending of this attractive effort is as usual with such men. The best of work "at the lowest price," etc., which you will likewise recognize is not very conducive to elevating the standard of dentistry or the fees either.

As the gentleman has "reformed," as is usually the case after obtaining all that duplicity could procure, we will pass on to another style.

Many of you are familiar with the following:

**Fourth Style  
of  
Advertising.**

"Extractions, 9 to 11 a. m.  
Wednesdays Free for the Poor.  
First-class Reference.  
Nitrous Oxide Gas Administered.  
Charges Reasonable."

This advertisement was carried for some years when it was relegated to the rear. Unlike the first newspaper advertisement I called to your attention, there is no deceit or false claims. He does not hold out as inducement for the public to accept his services the promise of cut-throat prices nor a suppositious charity. His prices are to be reasonable and for the poor he will relieve them of painful grinders free, which,



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to say the least, was a praiseworthy use of his professional knowledge. He advertised that he would do certain things, and he did just what he advertised. Later in life he wished to reform, as had the author of the first of my exhibits, but the latter wished to have a monopoly of the reform business and succeeded in blocking his effort.

Four other gentlemen carried advertisements somewhat similar at the same time; one of which says: "Dentistry in all its branches. Teeth inserted, \$7.00 per set. All work warranted." But as all of the four are either dead or have moved out of town, Providence has taken care of them, and perhaps on the other side of the river, like their companion on this side, are knocking at the gate asking for forgiveness.

### **Dental Parlor Advertisements.**

Next we will take up the "Advertising Dental Parlors, Companies," etc. Every one who is conversant with these individuals, their methods and their characteristic claims will readily compare them with my second exhibit. They are in the business for what they can get out of it in a financial way, regardless as to the patient's needs or their ability to carry out their bombastic pretenses. They have no professional instinct, and their ideas are confined to profit alone. Their advertisements are published with the same view as the bargain sales of the tradesmen—a catch-penny morsel to attract the unwary that they may fleece them. Their cut-throat prices are more apparent than real, for the business instinct and methods almost invariably obtain considerable more from the unfortunate that gets in their clutches than had been figured on when perusing their price list previous to an attempt "to obtain something for nothing."

The damage to the profession by such men as these is incomparable from a professional standpoint, and still they have their good points, inasmuch as they, to a certain extent at least, relieve us of considerable work which we would never get paid for, and thus perform a charitable act. They have also served their purpose as an educator of the public in calling their attention to its progress from an inventive standpoint, and, last but not least, spurred on the ethical man to progress and enlightenment upon modern methods and appliances, placing him in the position of absolutely being compelled to do all that the dental parlors *claimed* to do.

### **The Ethical Advertiser.**

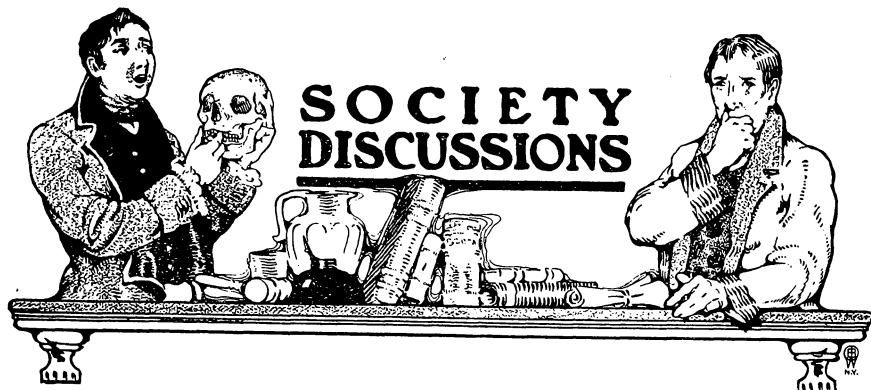
Last but not least, I will take up the "ethical advertiser." This is a gentleman who is hard to handle. He is a good deal like the case of the "Scotch verdict"—"Guilty but not proven." He is a pretty slick article and is just as oily as he is slick. He is generally a hard worker in the societies, an expert on committees, and sooner or later succeeds in getting into office. He reads papers at dental meetings or

clinics, or supervises in some function, and by hook or by crook succeeds in getting his name in the public press. If he reads a paper, he gets innumerable copies struck off and sends them to friends, relatives and patients—some times his own and some times those of other men. When he gets on a committee of his society or obtains an office, he can be relied upon to obtain stationery for all his correspondence upon which, outside as well as inside, these facts are plainly printed. At the annual meetings and the banquets he does not fail to arrange with the press for a publication of the list of officers and committees, etc. In using the printed stationery of his society he usually fails to distinguish between correspondence upon society matters and that of the private individual.

While these little “tricks of the trade” cannot be laid at the door of all “ethical men,” they have become so general in their use that it behooves those who are inside the society to remember that those outside have their grievances, too, and it’s a good maxim to recall once in a while “That people who live in glass houses should not throw stones.”

**The Moral.** The moral of this paper is, do not forget that we have faults of our own, and in dealing with our misguided brothers outside our gates, be careful that we do not offend, as retaliation may be in store for us. While they may resort to “ethical advertising” once inside the door, still we are able to control the extent and the effect, and we have a friend in place of an enemy. In union there is strength, and that applies to dental societies as well as other affairs. Let us open the doors, extend the hand of fellowship and good will to our erring brothers and show them that our mission in life is to help one another, lift up and not drag down, and let our motto be, “Do unto others as we would be done by.”





## Central Dental Association of Northern New Jersey.

The regular monthly meeting of the Central Dental Association of Northern New Jersey was held at Achtelstetter's, Newark, N. J., Monday, December 15, 1902. The president called the meeting to order. The minutes of the last meeting were read and approved.

The Executive Committee reported favorably on the following applications: Dr. H. W. Claypoole, Paterson, N. J.; Dr. Joseph Kussey, Newark, N. J. A ballot being taken, the above named gentlemen were unanimously elected to membership.

**Dr. Luckey.** I should like, if possible, to bring out a discussion on the subject of moss fibre gold. I have used it practically ever since it has been on the market, and my experience has led me to confine the use of it to small approximal, buccal or palatal cavities, where there would be no stress or strain on the gold. I have not been able to so condense it as to feel that I would have any special strength in the filling. In talking about this gold with other gentlemen I have been assured that they have used it in many exposed places, in the building up of contour fillings, and to make corners on incisor teeth with good satisfaction. I have not been able to so manipulate the gold that I have felt satisfied with its strength, or felt warranted in making contour fillings of it, and it occurred to me there might be some gentleman present who has had more experience with the use of moss fibre gold than I have, and that possibly he might be able to tell us how to so manipulate the gold that we could have strong fillings in exposed places such as I have not been able to make. If it is possible

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to so manipulate it, it does seem to me it would be an advantage, as it is so much more easily manipulated than foils or cylinders.

**Dr. Harlan.** I would like to ask Dr. Luckey if he would include the Watts crystal gold?

**Dr. Luckey.** No, I have never used it, but I should think all those sponge golds would come under the same heading.

**Dr. Harlan.** I have had quite a little experience with Watts gold, but I have not been able to manipulate it with hand pressure for contour work. When I have attempted it, while it looked very nice, it would break, but by using a fine point in an automatic mallet or an engine mallet I have been able to do much better.

**Dr. Luckey.** Contour fillings?

**Dr. Harlan.** Yes, contour fillings.

**Dr. Luckey.** I have heard of a good many who have been able to do it, but I have not.

**Dr. Harlan.** There is one thing I noticed about it and that is if you make it too long for the occlusion of the lower teeth it will wear; any gold will do that.

I might add that it would be a nice thing to have patients presented with that sort of work in the mouth. When a subject is presented in the academy in New York and papers of this kind are given, patients come there and the conditions are examined and it is more satisfactory to all concerned. I, for one, should be glad to bring patients with me to show the work.

**Dr. Leroy, New York.** I think Dr. Luckey must have designs on me; he attacks my weak point, although I hope it is a very strong point. Presuming his remarks were intended for me, I will reply. Moss fibre gold is used almost exclusively in my practice, which is a very busy one. I use it practically exclusively. The only deviation I have made in the last three years is to occasionally incorporate foil with it, on the surface of fillings—not always, very rarely I might say, and it is done simply to determine whether there is any advantage in using foil in conjunction with fibre gold. As yet I am not able to say there is any advantage. I do all kinds of contour work that comes under my care with the moss fibre gold and have no hesitancy in using it in any locality where I would use foil. I build up all contours with it as readily as in cavities in the masticating surfaces of teeth.

The method of procedure is very simple. The fibre gold is supplied in sheet form and after carefully removing the cottonoid top and the cotton fibers adhering to the surface, a portion of the gold is taken from



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the block and placed on a mica slab and heated at first sufficiently to drive from the gold any moisture that may be present. That leaves the material fairly soft and plastic, a quality required of any gold for adaptability to tooth walls. The base of any cavity can be manipulated very easily under these conditions. When nearing the surface the gold is heated again on the mica slab until there is a change in the color of the material and the gold becomes a reddish tint; by that means the material is annealed quite thoroughly. If the operation is on the masticating surface or a contour upon an incisor tooth I heat the gold through the mica until it is quite red hot, going over the flame with each piece of gold. I use the S. S. White points made especially for the purpose; the smaller ones of the set. I rarely use the larger points. The bases of cavities are built up with them until nearly filled. In contour work I use an Avil mechanical variable angle mallet in an engine propelled by an electric motor, which is preferable to the electric mallet. The electric mallet does not seem to work uniformly in my hands. The Avil mallet is more perfect in blow than any mallet I know of. Its principal advantages are its uniformity of blow whether delivered obtusely, acutely or directly.

Some years ago I used some moss fibre gold.

**Dr. Fisher.** I found there was a kind of a powder left after using it.

I think that was in the beginning of the manufacture of the gold. I had the advantage of possibly introducing that gold to the profession through Mr. Johnson of the S. S. White Company. I was asked if I would endeavor to determine which of several samples which he would submit to me would be most applicable for general work. I tried many made by different processes of manufacture before the ideal general product was determined upon.

**Dr. Luckey.** Samples?

No; and furthermore, let it be said, each box was paid for. Finally, after nearly a year's manipulation, we decided upon a product, and that is the product that is on the market to-day. I think it comes very near being par excellence. I am a strong advocate of moss fibre gold and have used much crystal gold since the early days of my practice.

**Dr. Fisher.** Have you tried DeTray's gold lately?

I tried it last winter again, and it worked nicely, too, but I would not substitute it for moss fibre gold.

**Dr. Leroy.** Of course that is very much a matter of opinion and it depends on how we become accustomed to manipulating the material.

I have an amalgam which I consider better than any other, but no



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doubt it is the method of manipulation which makes it more successful in my hands than any other. In gold there is not so much in manipulation as there is in learning how to use your product, after the manufacturer has done his best. I think we all manipulate gold very much alike, but with amalgams we differ. Moss fibre gold is very simple to manipulate, and I have had no hesitation, while giving clinics, to allow any one who wished to try the gold, to place it in the cavity and condense it. It can be used equally well in *ordinary* cavities with hand pressure as with a mallet, and that is one peculiarity of the gold which appeals to all.

Under the head of incidents of office practice, I

**Dr. Fisher.** want to call attention to a case which came to me about four months ago. The patient had been in my hands for other work some eight or nine years before, but at the time I speak of, her gums and the membranes showed every evidence of Riggs disease, although I had some doubts about its actual existence. The patient had been suffering from a severe sore throat and a physician had directed her to use as a nasal douche Siler's antiseptic tablets for her nose and throat. The effect of this wash in the mouth was most remarkable; and instead of her teeth being loose and her gums in a spongy condition, the teeth were very hard and firm and the gums perfectly healthy in a short time after using that wash. Since that time I have treated several other cases, and I believe that a good many that we treat for Riggs disease have a form of catarrh of the gums. In another case I have in mind I used borine, pyrozone, dioxygen and other preparations with no relief and effected a cure by the use of these tablets. I have used them in the case of my own sister, who had several loose teeth, with the utmost success.

In this connection I want to say that while I

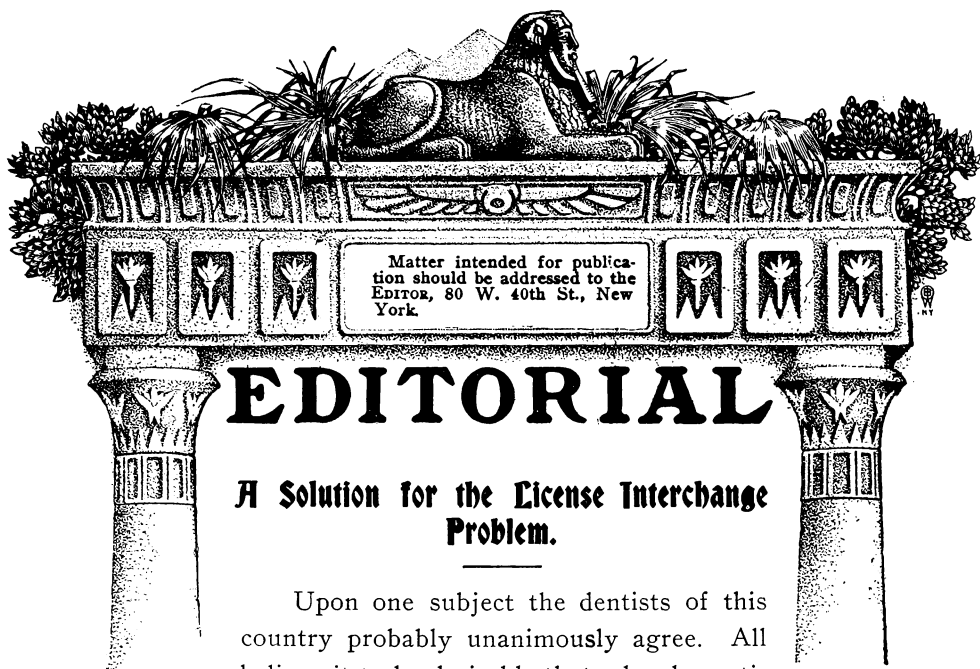
**Dr. Sutphen.** cannot express any opinion as to the effect of the use of the tablets in the mouth, I am using them for another purpose, and the specialist who recommended them informed me that the tablets made under Dr. Siler's personal supervision are much better than any other.

On motion a telegram of sympathy was directed to be sent by the secretary to Vice-President Pruden, who was too ill to attend this meeting.

The president appointed the following gentlemen as a committee to prepare a circular concerning bad debtors, etc.: Drs. Marshall, Fish and Hane.

On motion of Dr. Meeker it was resolved that the committee appointed about one year ago to take into consideration the establishment of a college of dentistry through the assistance of Mr. Carnegie be permitted to cooperate with a committee appointed by the National Association. On motion adjourned.





Matter intended for publication  
should be addressed to the  
Editor, 80 W. 40th St., New  
York.

# EDITORIAL

## A Solution for the License Interchange Problem.

Upon one subject the dentists of this country probably unanimously agree. All believe it to be desirable that a legal practitioner in one State should have the privilege of removing to another without the annoyance of passing the examinations of a licensing board. So soon as the means of accomplishing this is brought to the point of discussion, the views expressed become about as various and as numerous as the disputants.

Dentists apparently think that it is a matter of high importance that the dental laws of the various States should be so unified that a licensee in one may be entitled to practice in all. The fact is that the unification of many other State laws are of much greater importance to the communities, and to the whole people, and yet statesmen and lawyers consider it impossible to achieve anything like similarity in State statutes. For example, the diverse laws relating to marriage and divorce amount almost to a national disgrace, yet no effort is made to remedy the evil. Apparently then it is idle to talk of unifying the dental laws. There is no doubt that were a perfectly just statute drawn and offered simultaneously



in all State Legislatures, after passage the alterations and amendments would be so great that the State statutes would be as variable as now.

Is interchange of license then hopeless?

Certain States now have clauses in their laws under which interchange of license with other States is permitted, within certain limitations. The usual condition is that the candidate for interchange shall hold a license from a State, the law of which provides for as high a standard of education as the one asked to receive its licensee.

There is justice in this from the standpoint of those who originated such a requirement. Within these States are to be found dental schools. Manifestly these schools are compelled to live up to the educational standards of their own States. The only control which such States can exert over schools from other States, is through their Examining Boards, whose duty it is to see to it that the graduates from outside shall have reached the same standards as are compulsory upon the students within the State. Were this not done, and were it possible to make an interchange of license without regard to educational standards, it is self evident as a proposition, that schools with the less rigid standards would attract students away from schools of a higher order, since their graduates could pass an examining board in a State where the standards were low, and then pass by interchange into the States that they could not otherwise enter. This would be a grave injustice to the better schools, and would place a premium upon incompetency both in teaching and in practice.

But the only proper demand for interchange comes from men who are legitimately in practice and who may desire to change to another scene of activity. And while still admitting the impossibility of unifying either the laws or the standards, it seems feasible to obtain interchange of license without injustice to either the dental schools or to the general public.

The National Association of Dental Examiners,

**A Possible Solution  
of the Problem.**

while having no control, as a body, over State laws, is integrally composed of separate boards, each of which is charged with certain police power within its own State. These Boards, congregated together in convention, might agree upon a course, and returning to their several States might proceed to act upon the plan chosen. Should this be done this summer at Ashe-





## ITEMS OF INTEREST

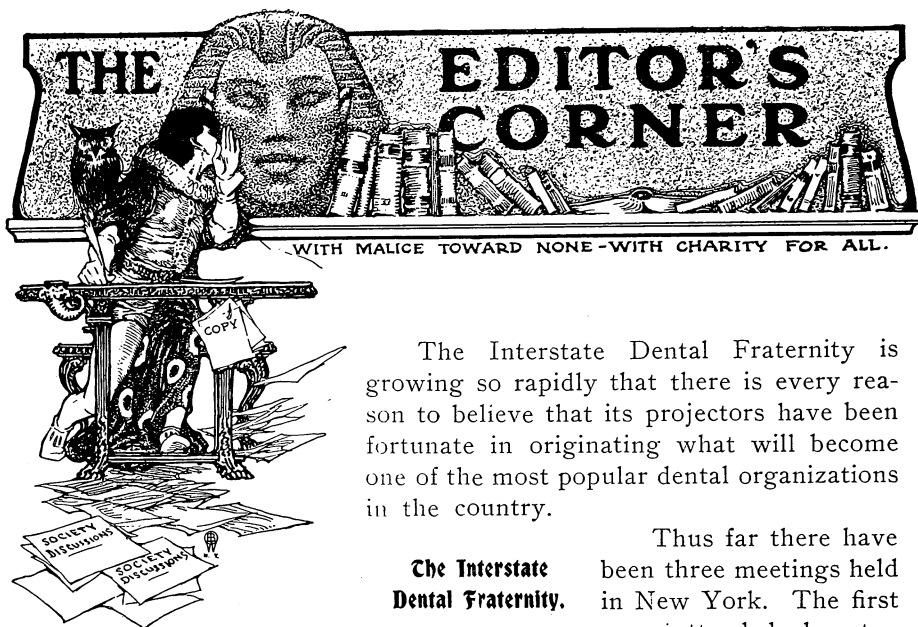
ville, and should an amendment in identical language be introduced next winter into the legislatures of twenty or thirty States, it is conceivable that in five, ten, or twenty of them the amendment might be adopted. If so, interchange of license would be inaugurated in several States within a year, and the number would be augmented from time to time.

Such an amendment, however, must be so couched as not to antagonize any just interest, neither the colleges, educational standards, nor the welfare of the people. The following is a proposal which seems to meet these requirements.

In substance, let it be enacted that any licensee of a State Board, who has been in legal practice within his State for a period of five years (or three perhaps) after having obtained his license, may apply to his own State Board for a certificate stating that he has been in legal practice for the term mentioned, and that he has during that time so conducted himself and his business that his State Board feels justified in recommending him for a license in the State to which he desires to remove. Secondly that upon receipt of such a recommendation from another State Board, an interchange license may be issued.

The feature of this is its simplicity. The requirement that the candidate for interchange must have been in actual practice for a period of years, obviates the taking of a license in one State for the sole purpose of moving into another, and this is ample protection to the college interests. On the other hand, the fact that the candidate had passed an examination before a State Board, obtained his license, and then entered into practice for a term of years, so conducting himself that his Board is willing to recommend him to another State, should be ample evidence of his capability, and thus is safeguarded the interests of the community. Finally the amendment is so simple that there should be little difficulty in having it passed in the majority of States, and thus those who for just and proper reason might desire to move their places of residence might be enabled to do so.





The Interstate Dental Fraternity is growing so rapidly that there is every reason to believe that its projectors have been fortunate in originating what will become one of the most popular dental organizations in the country.

#### **The Interstate Dental Fraternity.**

Thus far there have been three meetings held in New York. The first was attended by ten

men, the organizers. At the second meeting the membership was swelled to thirty-five, and at the third to seventy. Prior to the Asheville meeting, elections of members, etc., occur in New York City, but after that the organization will be more national in character and will be under the control of the Board, composed of the vice-presidents of the various States. Thus far local branches have been organized in four sections, one in New York with Dr. F. C. Walker as vice-president for that State; New Jersey with Dr. C. S. Stockton; Illinois with Dr. Hart J. Goslee, and the District of Columbia with Dr. Emory A. Bryant. The first annual dinner at Asheville ought to be a brilliant affair.

#### **Changes in the New Jersey Board.**

The New Jersey Board of Dental Examiners recently convened at the residence of Dr. Charles A. Meeker, meeting there because of the fact that Dr. Meeker is only just convalescing from a very severe attack of appendicitis, through which, his friends will be pleased to learn, he has been brought by skillful physicians without recourse to an operation. At the meeting of the Board Dr. J. Allen Osmun announced that he had resigned, due to the fact that he is leaving New Jer-





## ITEMS OF INTEREST

sey to take up a permanent residence in California. Governor Murphy appointed Dr. Charles S. Stockton to succeed Dr. Osmun. Dr. Meeker handed in his resignation as president of the Board. The members then elected Dr. William E. Truax of Freehold to be president. Dr. Meeker was made secretary and treasurer.

**Dental Office Robbed.** The office of Dr. F. T. Gabeka in New York City was entered by a burglar on April 11 and gold in various forms was stolen, amounting to about \$150. The burglar restricted himself to precious metal, which shows that he understood thoroughly the internal arrangements of a dental office and it will be well for other men to be guarded.

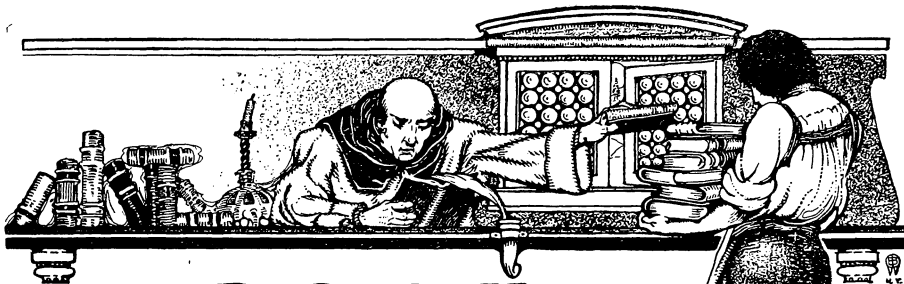
**A Simple Lathe Bath.** Dr. J. E. Storey, of Morenzi, Arizona, recommends the following as a means of obtaining a lathe bath:

Take a No. 7 brass wire fifteen (15) inches in length (I used a sash curtain pole), cut off eight (8) inches and bend at an angle, allowing two (2) inches for the angle, or more, if necessary. Cut a thread on the long end of the angle piece that will screw into the oil cup in the lathe. Make two nipples that will fit the wire snug, solder them together across each other, insert into the nipples a set screw, one screw to set the angle nipple, the other to set the sponge support. The sponge support is made from the remaining seven inches of wire. Cut a thread on one end of the support, to screw into a ring, the ring to hold and spread the sponge (I used a ring from the top of an old alarm clock), split the sponge and slip the ring into the split and secure the sponge in position with binding wire.

You will then have a good lathe bath, one that can be adjusted to any wheel. Will not throw water and will keep the wheel clean.

**Dental Law for Hawaii.** A new dental law has just been signed by the Governor of the territory of Hawaii. The act provides for an Examining Board of three practicing dentists to be appointed by the Governor on recommendation of the Dental Society of Hawaii. Except men already in practice no one will be licensed hereafter other than those who have a diploma from a reputable college and who shall pass an examination before the Board.





# BOOK REVIEWS

## Notes on Materia Medica, Pharmacology and Therapeutics.

For Dental Students and Practitioners.

By DOUGLAS GABELL and HAROLD AUSTEN.

Published by C. Ash & Sons,

London, Eng., 1902.

This is a work designed for the use of students proceeding to the examination for the L.D.S. of England and does not claim to be a complete treatise upon dental materia medica, simply referring briefly and practically to the properties, action and application of drugs, which are of utility and interest to the dental surgeon. The general therapeutic action of drugs has been left out, except where such action approaches the border line.

The authors are of the opinion that the pharmacological classification of drugs is the most practical one for the dentist and have adopted it, although it is open to the objection that it involves a good deal of cross-reference and unavoidable repetition.

In many instances in Part II. all materia medica, prescriptions and doses have been left out. On page 17 is the following: "The caustic action of arsenic may be employed as an obtundent of sensitive dentine in very shallow cavities." This method of obtunding sensitive dentine



## ITEMS OF INTEREST

has long since been relegated to charlatans and should find no mention in text books of the present day. Too great condemnation of it cannot be expressed. On page 92, under the head of hydrochloride of cocaine, the dose is given as 1-5 to  $\frac{1}{2}$  grain, which is correct. Under preparation "injectio cocainae hypodermica" (B. P.) 1 in 10, the following formula is given: "Cocaine hydrochloride 33 grs. Salicylic acid  $\frac{1}{2}$  gr., water 6 drs. Dose 2 to 5 mins." This is probably a typographical error and should have been 36 grains of cocaine hydrochloride and then the formula can be worked correctly. On page 93 is the following: "A solution of cocaine (4 per cent) applied in the form of a spray to the palate and fauces, is sometimes useful in checking retching during the taking of an impression." This is an uncertain and unscientific method of administering this drug and a *strong* solution to use in that locality. On page 94, under toxicology is the following: "Cocaine is a drug to be employed with caution, as alarming symptoms may follow an overdose. In no case should more than  $\frac{3}{4}$  gr. be injected." At the head of the article 1-5 to  $\frac{1}{2}$  gr. is given as a dose, making a discrepancy of  $\frac{1}{4}$  gr. Then follows: "9 gr. swallowed and 20 mins. of the preparation for injection are recorded as having caused poisoning! 20 mins. of said preparation is equal to 2 grs."

These statements are, to say the least, conflicting and bewildering and not likely to inspire confidence in the authors, nor to promise safety to a patient. On page 93, "Cocaine is all but useless for obtaining anæsthesia of a tooth pulp in which there is vitality, if merely applied to it as a solution or the crystals." No mention is made in this connection of pressure anæsthesia nor of the extirpation of pulps by cocaine and acids, nor yet in any part of the book of papain or caroid for digesting remnants of pulps that cannot be removed mechanically. On page 90, "Extreme heat destroys the irritability of protoplasm, and so is often employed as an obtundent—Example, hot air blast on sensitive dentine." This method does not work well in this country.

There is an appendix which contains quite a lengthy article on filling materials, and in a general way covers the subject very nicely. That portion of it which refers to amalgam, however, agrees with the older text books, but is hardly up to the methods of the present day in this country. It also contains an article on the cleansing and daily care of the mouth, which is very commendable. Also one on "Drugs which applied locally or administered internally, harmfully affect the teeth and associated structures," which deserves favorable mention, especially a paragraph on page 207 referring to stains. Also another by W. F. Mellersh on "The Restoration of Color in Devitalized and Discolored Teeth." This is a most excellent article, every sentence of which proves





the author to be familiar with the chemistry of the subject and also to have had wide experience. This article alone should insure an extended sale of the book.

Notwithstanding the exceptions above mentioned, the book is deserving of a place in every dental office and library.

R. C. B.

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## **Handbuch der Zahnheilkunde.**

Edited by DR. JULIUS SCHEFF,

a.-o. Professor, Vorstand des k.k. zahnärztlichen Instituts der Wiener Universität.

Published by Alfred Hölder, Vienna, 1902.

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This work, now in course of publication, is a second and revised edition of one published under the same auspices, 1891-92.

The original work consisted of three large octavo volumes, but as the second volume was divided into two parts, it really formed four volumes, aggregating over 2,300 pages and 860 illustrations. While less pretentious, it followed closely the general plan of The American System of Dentistry, the subject matter being furnished by a corps of collaborators working under the direction of the editor.

This new edition, according to the prospectus, will be published in thirty parts (ten of which have now been issued), forming four volumes, with about one thousand illustrations. While some changes have been made in the contributors, and in the order in which the subjects are arranged, as far as published the new edition preserves the encyclopedic character of the old one. It is, however, being rewritten and brought as closely as such a work can be, thoroughly up-to-date. A commendable feature is that of placing together and by themselves, at the end of each article, the references usually found at the bottom of each page. They there form a comprehensive index to the literature consulted by the writer.

Under the able management of Dr. Scheff, it promises to be as valuable a contribution to German dental literature as was its predecessor.

W. H. T.





# SOCIETY ANNOUNCEMENTS

## National Society Meetings.

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National Dental Association, Asheville, N. C., July 28.  
National Association of Dental Examiners, Asheville, N. C., July 24, 25 and 27.  
Interstate Dental Fraternity, Asheville, N. C., July 28.

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## State Society Meetings.

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California State Dental Society, San Francisco, June 9.  
Colorado State Dental Association, Denver, June 16, 17, 18.  
Georgia State Dental Society, Tallulah Falls, June 9.  
Idaho State Dental Society, Boise City, June 9.  
Indiana State Dental Association, Indianapolis, June 30, July 1, 2.  
Maine Dental Society, July 21, 22, 23, Kineo, Moosehead Lake.  
Massachusetts Dental Society, Boston, June 3, 4.  
Michigan Dental Association, Petoskey, July 7, 8, 9.  
Minnesota State Dental Association, Minneapolis, Sept. 1.  
New Jersey State Dental Society, Asbury Park, July 15, 16, 17.  
Ohio State Dental Society, Columbus, Dec. 1, 2, 3.  
Pennsylvania State Dental Society, Harvey's Lake, July 7, 8, 9.  
South Dakota Dental Society, Redfield, June 3, 4, 5.  
Tennessee Dental Association, Chattanooga.  
Virginia State Dental Association, Hot Springs, July 22-24.

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## National Association of Dental Examiners.

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The National Association of Dental Examiners will meet at Asheville, North Carolina, July 24, 25 and 27, 1903.  
Kansas City, Kan. J. P. Root, Sec'y.



## **National Dental Association.**

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Meets in Asheville, N. C., Tuesday, July 28.

Preparations are being made for one of the best meetings in the history of the Association. The Section officers are preparing a programme, which, from a scientific and practical standpoint, will be difficult to excel. The clinics will be made a special feature.

All dentists interested in the advancement of the profession should attend this meeting.

All State and local societies should elect delegates who will be sure to attend the National meeting, they being entitled to one delegate for every six of their members.

The usual railroad rates will be had on all roads in the United States and part of Canada—one fare and a third, on the certificate plan.

A. H. PECK, Rec. Sec'y.

L. G. NOEL, President.

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## **New Jersey State Dental Society.**

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The thirty-third annual session of the New Jersey State Dental Society will be held in the Auditorium, Asbury Park, commencing on Wednesday, July 15, at 10 o'clock a. m., and continuing 16 and 17. Four good papers will be read by prominent members of the profession and special energy displayed, as was last year, in bringing before the dentists everything new and novel in clinics, together with an array of exhibits that will make apparent the advances in this line by a year's efforts. The Auditorium is the largest exhibit hall in the State and all space is, at the present writing, nearly taken. The Columbia Hotel will be the headquarters and the rate will be \$2.50 and \$3.00 per day. Mark these dates off now.

CHAS. A. MEEKER, Sec'y.

29 Fulton street, Newark, N. J.

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## **Delaware State Dental Society.**

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A regular meeting of the Delaware State Dental Society will be held on the first Wednesday in June.

Wilmington, Del.

R. H. JONES, Secy.





## **Maine Dental Society.**

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The thirty-eighth annual meeting of the Maine Dental Society will be held at Kineo, Moosehead Lake, July 21, 22 and 23, 1903. This is an ideal opportunity to visit this beautiful spot, the most attractive summer resort in the State. All dentists are cordially invited to meet with us, and we especially extend an invitation to those who are natives of Maine to participate in a pleasant and profitable reunion. We are to have papers and clinics by men of national reputation, including Dr. L. P. Haskell, of Chicago; Dr. W. A. Capon, of Philadelphia, and Dr. R. Ottolengui, of New York. The Mount Kineo House accommodates five hundred guests and grants us half rates on this occasion. Reduced railroad rates from Portland.

Dexter, Me.

C. H. HAINES, Ch'man Ex. Com.

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## **Virginia State Dental Association.**

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There will be a meeting of the Virginia State Dental Association at Hot Springs, Va., July 22-24, 1903. F. W. STIFF, Chairman.

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## **New Mexico Board of Dental Examiners.**

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The newly appointed Board of Dental Examiners for New Mexico is as follows: L. H. Chamberlain, president, Albuquerque; C. N. Lord, secretary and treasurer, Santa Fé; F. E. Olney, Las Vegas; E. L. Hammond, Las Vegas; A. A. Bearup, Carlsbad. Term of office is four years.

Santa Fé.

C. N. LORD, Sec'y.

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## **South Dakota Dental Society.**

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The annual meeting of the South Dakota Dental Society will be held at Redfield, S. D., June 3, 4 and 5. The meeting will begin on June 3 at 10 a. m. A fine programme is assured. All reputable dentists of this and other States are cordially invited.

The State Board of Dental Examiners will be in session at the same time and place.

W. W. PRICE, Sec'y.

Centerville, S. D.

D. ST. I. DAVIES, Pres.

Woonsocket, S. D.



### **National Association of Dental Faculties.**

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The National Association of Dental Faculties will convene in the ball-room of the Battery Park Hotel, Asheville, N. C., July 24, 11 a. m.

The Executive Committee will meet at same place Thursday, July 23, at 2.30 p. m. All parties having business with this committee are hereby notified to be on hand at this time.

S. W. FOSTER, Sec'y. Ex. Com., N. A. D. F.

H. B. TILESTON, Chairman.

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### **Colorado State Board Dental Examiners.**

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The Colorado State Board of Dental Examiners will meet at Denver, June 2, 1903. All applications for examinations must be filed with the secretary before that date.

M. S. FRASER, Sec'y.

407 Mack Bldg., Denver, Colo.

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### **West Virginia State Board of Dental Examiners.**

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The West Virginia State Board of Dental Examiners will hold its spring meeting for examinations June 3, 4, and 5, at Charleston, W. Va. For further information address the secretary.

Cor. 4th Ave. and 9th St., Huntington, W. Va.

W. A. WILLIAMS, Sec'y.

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### **Massachusetts Dental Society.**

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The thirty-ninth annual meeting of the Massachusetts Dental Society will be held in the Mechanic's Building, Boston, on June 3 and 4, 1903.

EDGAR O. KINSMAN, Sec'y.

15 Brattle Sq., Cambridge, Mass.

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### **Virginia State Board of Dental Examiners.**

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The next meeting of the Virginia State Board of Dental Examiners will be held in Richmond, Va., beginning Tuesday morning, June 9, 1903.

Norfolk, Va.

R. H. WALKER, Sec'y.





### **California State Dental Association.**

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The thirty-second annual session of the California State Dental Association will be held June 9 and continued for four days in the city of San Francisco. A large attendance is expected; the programme being furnished is an exceptionally interesting one.

O. P. ROLLER, Cor. Sec'y.

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### **Georgia State Dental Society.**

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The next meeting of the Georgia State Dental Society will be held at Tallulah Lodge, Tallulah Falls, on Tuesday, June 9, 1903.

Atlanta, Ga.

O. H. McDONALD, Sec'y.

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### **Idaho State Dental Society.**

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The Idaho State Dental Society will hold its seventh annual meeting at Boise City on Tuesday, June 9, 1903. All members of the profession are invited to attend. The officers and members are endeavoring to make the meeting a success and earnestly request a helping hand from the profession.

K. C. JOYNER, Sec'y.

Nampa, Idaho.

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### **Colorado State Dental Association.**

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The Colorado State Dental Association will meet in Denver, Colo., on June 16, 17 and 18, 1903.

W. A. BRIERLY, Sec'y.

70 Barth Block, Denver, Colo.

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### **Indiana State Dental Association.**

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The forty-fifth annual meeting of the Indiana State Dental Association will be held at Indianapolis, June 30, July 1 and 2, 1903. Indiana extends a cordial welcome to the profession.

Rushville, Ind.

R. F. McCLANAHAN, Sec'y.



### **Michigan Dental Association.**

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The forty-seventh annual meeting of the Michigan Dental Association will be held in Petoskey July 7, 8 and 9, 1903. Come to Petoskey and spend your vacation on the above dates.

F. H. ESSIG, Sec'y.

Dowagiac, Mich.

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### **Pennsylvania State Dental Society.**

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The Pennsylvania State Dental Society will hold its thirty-fifth annual meeting at Harvey's Lake, on July 7, 8 and 9, 1903.

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### **Vermont State Board of Dental Examiners.**

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The Vermont State Board of Dental Examiners hereby give notice that they will meet at the Pavilon Hotel, Montpelier, on Tuesday, July 14, 1903, at 2 o'clock p. m., for the examination of candidates to practice dentistry. Application blanks together with rules and instructions to candidates can be had by applying to the secretary. Applications with the fee, ten dollars, must be filed on or before July 5, 1903.

St. Johnsbury, Vt.

GEO. F. CHENEY, Secy.

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### **New Jersey State Board of Registration and Examination in Dentistry.**

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The New Jersey State Board of Registration and Examination in Dentistry will hold their semi-annual examination on Tuesday, July 7, Wednesday, 8, and Thursday, 9, 1903, at the Assembly room of the State House at Trenton, N. J. Sessions begin promptly at 9 a. m. All applications must be in the hands of the secretary ten days prior to the examination.

J. ALLEN OSMUN, Sec'y.

588 Broad St., Newark, N. J.

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### **Pennsylvania State Board of Dental Examiners.**

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The Board of Dental Examiners of Pennsylvania will conduct examinations simultaneously in Philadelphia and Pittsburg June 9-12, 1903. Address the Dental Council, Harrisburg, Pa., for application papers and further particulars.

G. W. KLUMP, Sec'y.

Williamsport, Pa.





### **North Carolina State Board of Dental Examiners.**

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The Board of Dental Examiners for the State of North Carolina will meet in Winston-Salem, N. C., Monday, June 15 at 10 a. m. All applications must be filed with the secretary on or before that time. In addition to the written examination, applicants will be required to fill with gold at least one approximal cavity, selected by the Board. Each applicant must also bring a partial upper denture (not less than eight teeth) ready for soldering, hard solder required, which work must be done under the supervision of the Board. All materials and instruments must be furnished by the applicants.

R. H. JONES, Sec'y.

Winston, N. C.

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### **Massachusetts Board of Registration in Dentistry.**

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There will be a meeting of the Massachusetts Board of Registration in Dentistry, in Boston, for the examination of candidates, June 24, 25 and 26. Application blanks and further information may be obtained from the secretary.

GEORGE E. MITCHELL, D.D.S., Sec'y.

25 Merrimack St., Haverhill, Mass.

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### **Ohio State Board of Dental Examiners.**

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The Board of Dental Examiners of the State of Ohio will meet at the Hartman Hotel, Columbus, June 30, July 1 and 2, for the purpose of examining candidates for certificates of registration.

All applications should be filed with the secretary by June 20.

For further particulars address

112 East Broad St., Columbus, Ohio.

H. C. BROWN, Sec'y.

